PACKAGE engineering

Answer to the problem of testing packages under *store* conditions: A specially-developed variable temperature, constant humidity cabinet 13

An expert's analysis of packaging line layout — with special attention to factors contributing to high speed operation..... 17

How to combine packagers' manual skills and specially-modified packaging machinery — to maintain speed and flexibility on diverse product line..... 32

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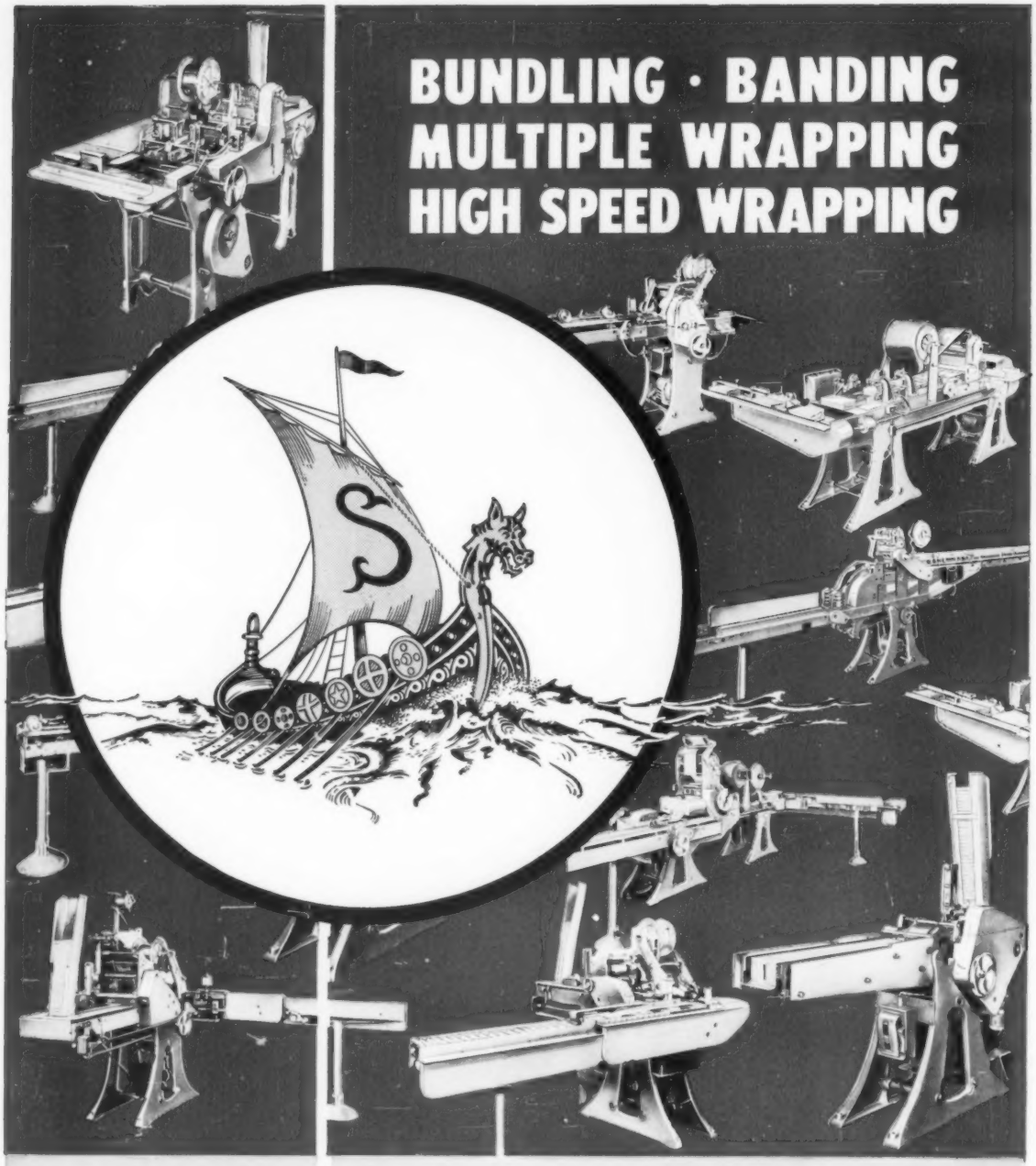
JANUARY 1956



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Research and Development Laboratories for Aluminum Foil Packaging

Report No. 1 of a Series by Reynolds Metals Company

Research staff and laboratory equipment are necessarily the means by which packaging progress is achieved. It is felt, therefore, that an overall view of research facilities is a proper subject for the first article in this series. Those following will deal with specific properties of aluminum foil as applied to packaging.

Reynolds Metals Company operates two packaging laboratories—the Research and Development Laboratory at Richmond, Va., and a laboratory specializing in printing problems, in conjunction with Reynolds printing plant at Harrison, N. J.

The primary purpose of Reynolds Research and Development laboratory is to explore all possibilities of future developments in foil packaging and in industrial foil applications. Coincidentally, the Laboratory conducts continuing development and evaluation of all materials used in conjunction with aluminum foil—papers, adhesives, inks, coatings, waxes, hot melts, plastic films, etc.

A function of utmost importance is the technical service rendered on individual packaging problems that arise within the packager's plant. Such service provides for positive technical assistance in all fields, as it allows a trained man to work within the packager's plant, to assist in solving his problems. Such assistance is available through Reynolds regional representatives.

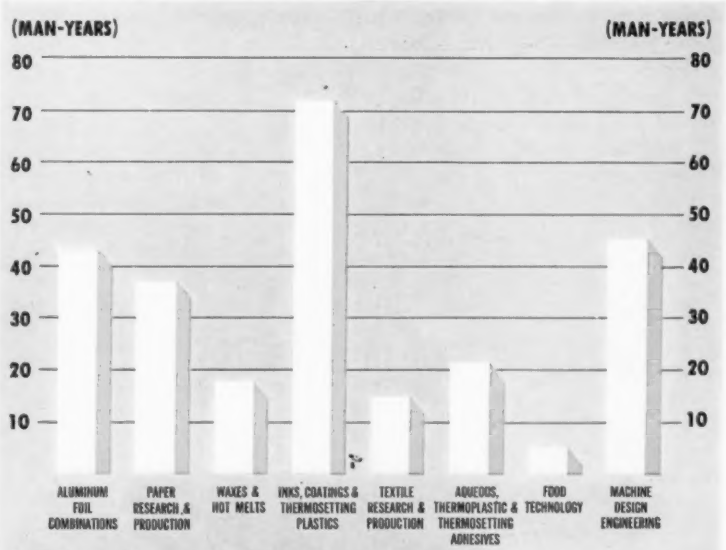
The Laboratory is not only fully equipped for testing of raw materials and new combinations; it can also duplicate practically any plant operation. Equipment includes, in addition to pilot machines:

Walk-in cabinets that can be maintained under various temperature and humidity conditions • Simplex bag-making machine • Sentinel, Seal-Craft and Doughboy heat-sealing machines • Completely equipped Home Economics Kitchen • Spectrophotometer • Photographic Rooms • Deep-Freeze Room • Vibration Machines • Atlas Fadeometer • Atmosphere Control Company moisture vapor transmission cabinets • Complete equipment for paper and foil testing.

The Research Staff at Reynolds Richmond Laboratory, consisting of 30 Technicians, represents extensive experience in all fields concerned with packaging—as summarized by the chart shown. Of the 15 key men, 10 are chemists, 3 are chemical engineers, 1 a machine engineer and 1 a food technologist. Each is a specialist in his own field. One holds a Doctor's degree and three hold Master's degrees. One of the Master's degrees is in Food Technology.

This Laboratory and its Staff have been responsible for many important developments in aluminum foil packaging. Among these are: caustic soluble beer labels, soap packages, margarine and butter packages, fiber canister labels and liners, many different heat-sealing foil laminations and semi-rigid containers. Problems currently in the course of solution for packaging customers promise further important developments.

MAN-YEARS EXPERIENCE OF 15 REYNOLDS RICHMOND LABORATORY SPECIALISTS



Reynolds Metals Company, General Sales Office, Louisville 1, Kentucky

JANUARY 1956 • VOLUME 1 • NUMBER 1

PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

A look ahead

Ever faced the problem of having to package a steady flow of products on a line subject to frequent stoppage for package size and material changes? Finley Leech, production manager of the Baking Division of Zion Industries, Inc. faced exactly that problem, with 5,000 pounds of fig bars hourly moving down a line that makes many package changes. Next month we shall present our story of how Mr. Leech solved this problem—by switching to bulk packing during periods of wrapper downtime.

Those of you having to package a living organism can appreciate the problem which confronted Dr. A. A. Hendrickson, chief bacteriologist of The Albert Dickinson Company's Farm Laboratory Division. It took him years to get just the right package for his company's legume inoculators, which require packages with breathing properties as well as those of moisture retention. Our next issue carries Dr. Hendrickson's account of his detailed experimentation leading to his current packaging.

These two articles emphasize one of our basic editorial approaches, to focus attention on the practical solution of specific packaging problems. Since the constant interchange of know-how for the mutual benefit of you, our readers, dictates special attention to these cases of "problems-solved" we invite you to write us about them. We look forward to hearing from you.

—R. B. H.

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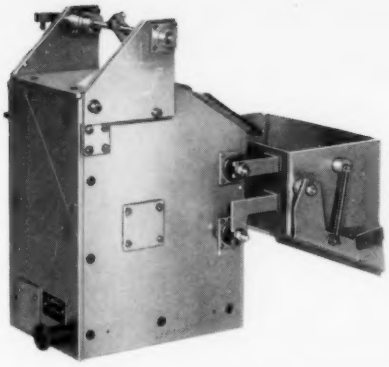
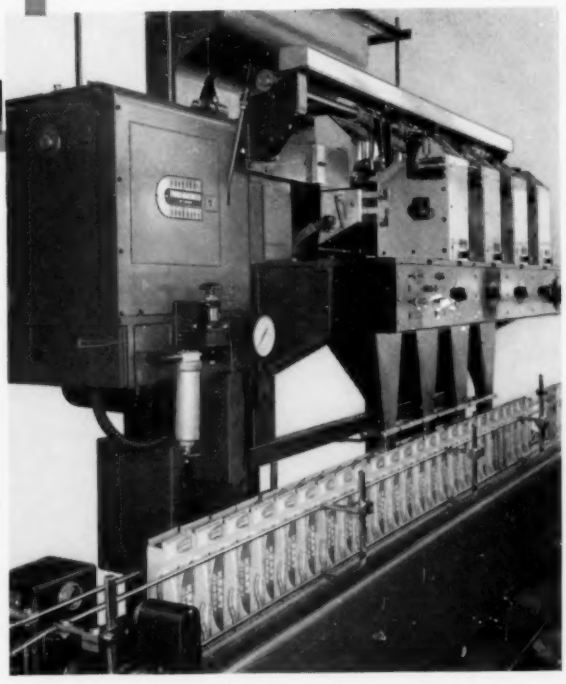


IN THIS MAGIC BOX



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A note from the Publisher

As you go through this, the first issue of PACKAGE ENGINEERING, various questions may occur to you. You may wonder why you are receiving PACKAGE ENGINEERING, what will be the purpose of its editorial pages in future issues, how will the advertisers help you in your business. I'd like to answer these three questions briefly.

First, the magazine is being sent to you because you are concerned with package engineering, in one or more of the general areas we will cover editorially — packaging line production, packaging research and development, or the purchase of packaging materials or supplies. If you are not receiving PACKAGE ENGINEERING addressed to you personally, but would like to, fill out the New Reader Card and mail it — we will pay the postage. PACKAGE ENGINEERING will then be sent to you monthly at no charge if you meet our qualifications.

Editorially, our aim is to perform the basic but sometimes forgotten purpose of a business magazine — to serve as a medium of continuing adult education. Because of the rapid and tremendous growth of the packaging field — not only in size, but in complexity — much education in the packaging field has been in the costly school of experience. By providing a monthly medium for the dissemination of ideas in the package engineering field, we hope that in some measure we can help reduce waste in the packaging operation and increase the efficiency of the packaging function. In the editorial pages of PACKAGE ENGINEERING we will bring you the thinking of a wide variety of technical and production men who will be writing on the engineering aspects of the packaging field.

The advertisers in PACKAGE ENGINEERING are leaders in the field well qualified in experience and personnel to help you solve the many technical and production problems of packaging in 1956. We urge your patronage of these companies. In our reader service section you will find a business reply card to make it easy to get further information about any advertised product or service, to receive copies of current literature or data about machinery and product announcements.

If you are interested in products or services not advertised in this or subsequent issues, we'll be glad to put you in touch with the proper parties if you will write us.

After you have read this issue, we would like to hear from you as to what you do or do not like about PACKAGE ENGINEERING — and tell us of particular problems you'd like to have discussed in our editorial pages.

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PACKAGE engineering

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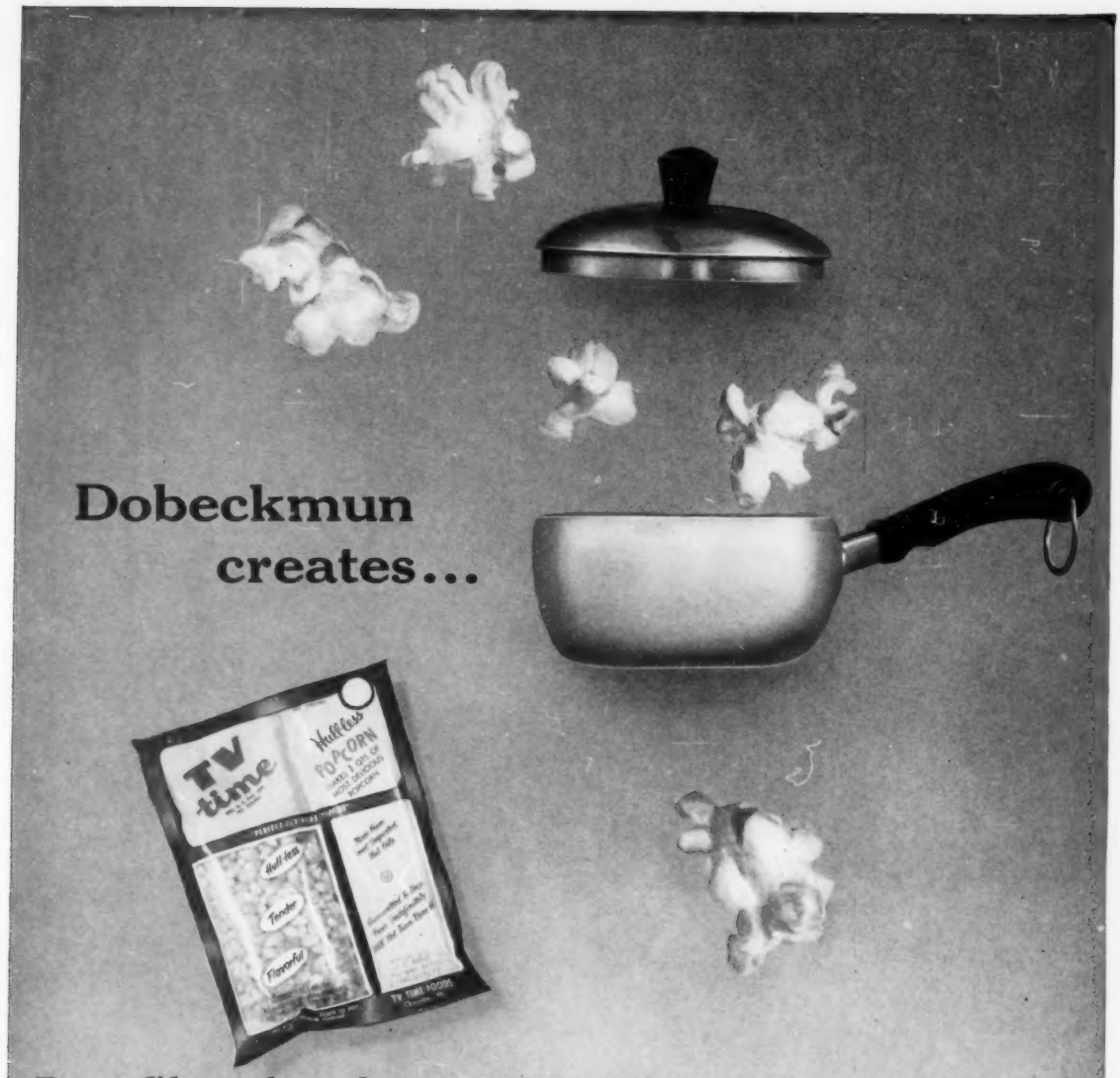

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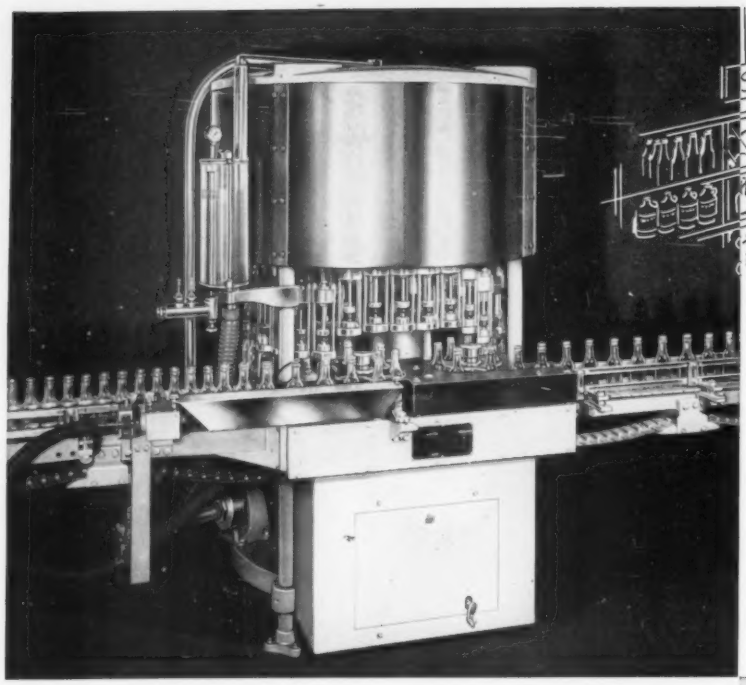

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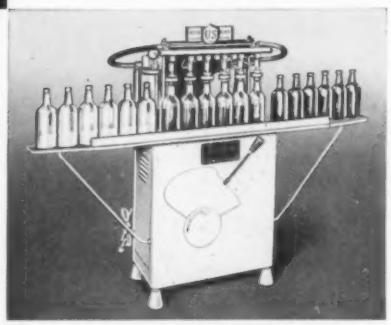

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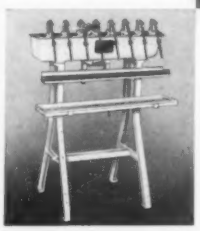

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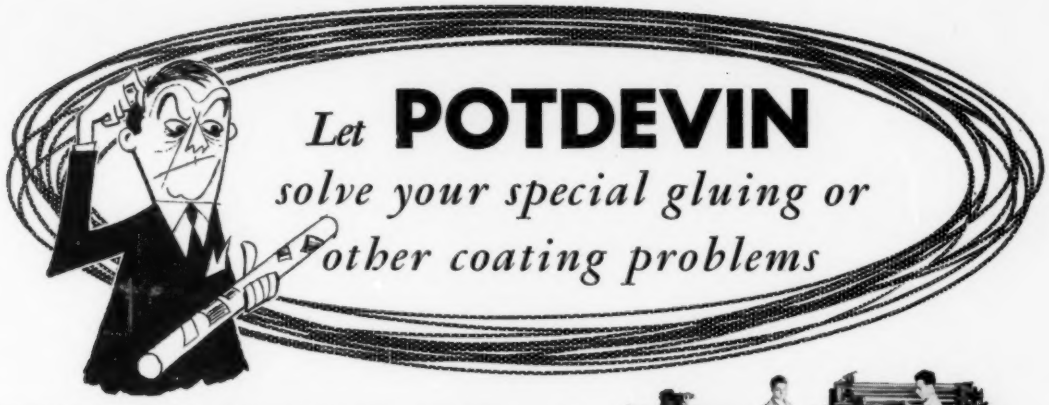

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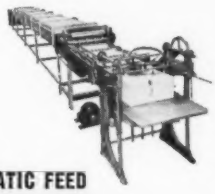

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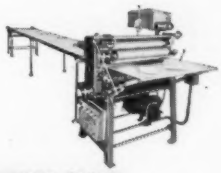

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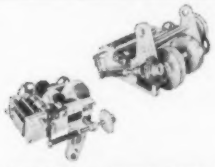

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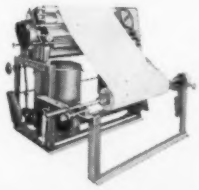

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A standard refrigerator is the nucleus of the VTCH test cabinet. Starting with this unit the staff of the Technical Institute added the equipment and controls necessary to form the cabinet. It is still operative as a refrigerator.

Proper spacing of packages contributes to adequate movement of air currents through cabinet. Ordinary copper downspouting serves as the duct work. Barely visible at lower left of cabinet interior is the wick chamber.

This wick chamber's overflow fills the humidifier. There must be a steady drip of water back to sump pump from humidifier to operate float switch often enough to keep wicks wet on thermoswitches. The cabinet uses a small centrifugal pump to circulate water through cycle.

Testing package efficiency with a variable temperature, constant humidity cabinet

By Ralph W. Eide and Thomas E. Hollingshead,
Technical Institute of Independent Biscuit Manufacturers' Company, Chicago

Seeking a way to test packages of crackers and cookies under actual store conditions of temperature and humidity, Mr. Eide and Mr. Hollingshead (and others of their staff) came up with a variable temperature, constant humidity test cabinet. In this article they tell how the equipment was developed, how it works—and what sort of test results it provides, especially in determining the efficiency of these packages in retarding moisture-vapor transmission.

TWENTY to 30 years ago the packaging problems of biscuit and cracker products were restricted to a few specialty items with a fairly fast turnover. Bulk packages and large family size tin caddies were the rule. Seldom today do any products find their way into this type of packaging. With the introduction of the one pound cracker package, came new problems but still not much chance of improving the style and quality of packages until after World War II: Now there are many, many types and combinations of package materials and there is an equal number of questions asked about the relative value and protection offered by each.

Here at the Independent Biscuit Manufacturers' Company Technical Institute the first attempts to evaluate the materials followed the old method using $CaCl_2$ protected from a humid atmosphere by a single sheet of the material under test. This was found faulty. We next tried placing a commercial package in a 100 per cent RH atmosphere. We soon found that this

had an adverse effect on the material itself and represented a condition that would never be encountered.

Simulating Store Conditions

The next development consisted of a series of containers with a different relative humidity in each. This at first seemed to yield the desired results but still did not have the necessary correlation with actual conditions on the store shelves. In order to obtain the necessary similarity between actual conditions to which commercial packages are exposed and any test procedure and also to be sure that the package would give good protection under the most severe conditions normally encountered, it was decided that the test would have to provide a moderately high temperature and humidity such as would be found in a warm climate during the day and a lower temperature with a high humidity to correspond to the conditions found at night.

While the standard humidity containers we had been using furnished some of this effect, it was impossible to obtain reproducible results since the ambient temperatures in the laboratory were not reproducible.

At the time there was no equipment on the market which would provide the necessary cyclic temperature while the humidity was held constant. By obtaining a cycle of temperature a breathing action through the package material is achieved due to the expansion and contraction of the air. This action will cause the package product to gain more moisture than if exposed to a constant temperature. The reason behind this is that during the period when the temperature is dropping from 90 degrees F to 70 degrees F the air inside the package is contracting at the same time as the air outside is becoming saturated with moisture. Since there is a differential in pressure, any minute leak will allow the moisture laden air to enter the package through any pinhole. Thus the product will absorb more moisture.

Staff Develops Cabinet

Albert Vander Kloot worked out an electrical system starting with a standard refrigerator (eleven cubic feet) and adding commercially available relays, wet and dry thermoswitches, 150-watt heaters, copper downspouts for the duct work and recording thermometer for long range control. This gave us our variable temperature-constant humidity (VTCH) cabinet. All the work was done in our laboratory.

The timer clock, thermoswitches, and relays which they control are the heart of the cabinet. The timer cycles at 70 degrees F for twelve hours and at 90 degrees F for twelve hours, as is shown in the accompanying chart. This cycle may be varied to suit any special conditions which other tests require. At 70 degrees F. the conditions are controlled by the wet and dry thermoswitches which in turn operate the relays actuating the heater and refrigerator. At 90 degrees F the same system is used.

The refrigerator unit has the original controls on it and can be used as a regular unit by switching out the wet bulb thermoswitches which activate it. Our heater units were placed inside the duct in order to obtain the maximum air flow over them and to prevent hot spots. After some experimenting with various heating elements, we found that two 150-watt strip heaters were the best.

How Equipment Works

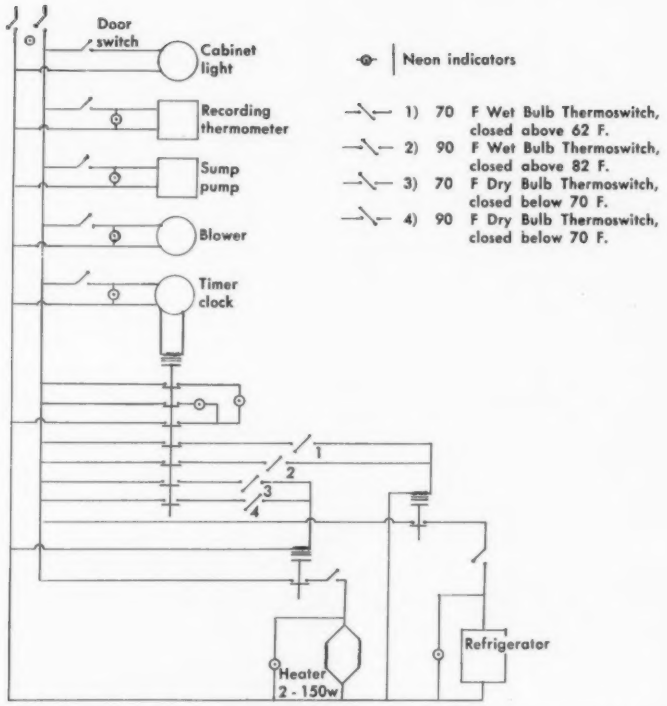
The air flow through the duct enters the cabinet in the refrigerator unit and leaves at the bottom immediately under the wet-dry thermoswitches. The duct also contains a humidifier and blower. The flow of air is high enough to maintain uniform conditions through the cabinet when the packages are in place.

The humidifier is filled by the overflow from the wick chamber. A steady drip of water back to the sump pump from the humidifier is necessary to operate the float switch often enough to keep the wicks wet on the thermoswitches. The water is circulated through its cycle by a small centrifugal pump.

We have learned to make a wide variety of tests as our work progresses with the VTCH. The first surveys run for the members of the Technical Institute covered a one week period. Now extended protection tests covering many weeks have been worked out. The cabinet has also proved useful in making destructive type tests on products such as marshmallow bon bons and enrobed cookies. A major part of the time the VTCH test is run in conjunction with other tests bearing on the qual-

Ralph W. Eide has been on the staff of the Technical Institute for seven years, joining it following his graduation from Northwestern University — with a degree in mathematics. His work with the Technical Institute involves research and testing of products and packages, as well as quality control and material control. Mr. Eide is a member of the American Association of Cereal Chemists.

Thomas E. Hollingshead, director of the Technical Institute, has been associated with it for 19 years. Prior to that he was with Griggs Cooper & Company, St. Paul. He is a graduate of the University of Illinois. Mr. Hollingshead is a member of American Chemical Society, Institute of Food Technologists and the American Association of Cereal Chemists. As director of the Technical Institute he is in charge of the consulting, research and technical services it provides to members of the Independent Biscuit Manufacturers' Company.



Electrical system details of the Technical Institute's VTCH cabinet are revealed by this drawing. Albert Vander Kloot, a former member of the staff, worked out this system for the VTCH cabinet. It makes extensive use of commercially available components.

ity and uniformity of the products submitted by member companies.

Checks Packaging Line

The VTCH cabinet's control system allows us to compare packages from the same source at periodic intervals thus maintaining a check on the packaging materials as well as the operating efficiency of a plant's packaging department. Likewise under controlled conditions as many as ten alternative packing materials may be tested at one time. Since in the best available packaging materials a small flaw in the handling or wrapping machinery will be able to nullify all of its advantages, it is posible for this test to show that a machine is not forming the seal and wrap that it should.

The Technical Institute's cabinet still has a few problems which affect its operation. The major mechanical problem arises when the room temperature exceeds 95 to 97 degrees F., at which time the relays are affected by excess expansion. Also we have found that the humidity will sometimes drift down to 63½ per cent. We think we have corrected this. The last and perhaps the major problem is that we do not have anyone using this type of equipment with whom we might exchange data and ideas.

Test Procedure And Analysis Of Results

An example of testing various materials in relation to each other is embodied in the following figures, the results of a one week test.

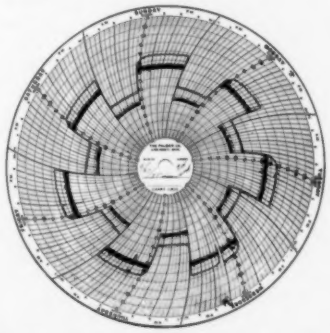
marked	per cent original moisture	per cent final moisture	per cent average gain
No. 126 Opaque Wax	1.95	2.48 2.33 2.45	.47
No. 127 Special Cellophane	2.05	2.25 2.55 2.10	.25
No. 128 Double Wrap of 300 MST Cellophane	2.04	2.45 2.80 2.80	.64
No. 128 Parchment Laminate	2.08	3.08 3.65 3.13	1.31

Determined by their average gain all but No. 128 are classified as affording satisfactory protection. No. 127 would be classed as slightly better on the machines used to form the packages in this test.

Following are the results of a series of tests on the same material on consecutive weeks.

week	per cent original moisture	per cent final moisture	average gain in moisture
1st	2.03	2.13 2.28 2.18	.17
2nd	2.18	2.20 2.30 2.20	.05
3rd	1.83	2.50 2.15 2.35	.50
4th	2.15	2.20 2.30 2.25	.10

In all of the above tests the results were termed satisfactory for pound packages of saltine crackers. However the results of the third week showed a slight overbake as determined by the original moisture. It also showed a possibility of the forerunner of trouble or a slight defect in the setting of the sealing machine. The fourth week shows that this is corrected at least temporarily.



This is an actual chart, taken at random from the files of the Technical Institute. It illustrates the cyclical action of the cabinet, showing the alternate periods of 70-degree and 90-degree temperatures — with actual variances indicated by the recorded chart.

TAILOR-MADE PACKAGING PAPERS

POWDERED FOODS: Pouchpak*, a laminate of special pouch paper, polyethylene and foil . . . heat-seal coated . . . protects Borden's Instant Starlac. Run on Pneumatic Scale Model 769 machine at 45 per minute. *TM

COFFEE: The flavor of Horton's Coffee is carefully protected by Riegelpak, a duplex package of special pouch stock and heat-seal glassine. Run at high speed on Package Machinery Transwrap.

CAKE MIXES: Dromedary Cake Mix contains two Pouchpak* pouches, made of poly-coated laminated glassine printed by Riegel. Hayssen Model F machine runs 48-60 packages per minute.

CRACKERS: Nabisco Sugar Honey Grahams are kept crisp in a Riegel "Tailor-Made" waxed glassine. The ½ lb. inner-seal units are run 60 to 85 per minute on Model 49 Battle Creek machine.

DESSERTS: Knox Gelatin is packaged in special Riegel pouch paper, gravure printed with registered heat-seal imprint. Bartelt machine fills, seals and cartons pouches at high speed.

CANDY: Strong, attractive Pouchpak* packages protect the quality of M & M's Peanut Candies, yet are easy to open and stack neatly. Run at 80 per minute on Stokeswrap Model "BS" machine.

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This feed guide takes the place of grippers used to control movement of cans in capper. Mr. Sherwood points out that if cans are introduced smoothly and positively by a worm feed a simple guide is enough, so that conventional grippers that open and close are not necessary. He notes that it is desirable to reduce the number of moving parts wherever possible.

Packaging line layout

By C. E. Sherwood,
Industrial Engineering Manager,
S. C. Johnson & Son, Inc., Racine, Wisconsin

Here is "know-how" in action. To meet the changing requirements of not only new packages but also new combinations of packages, the engineers of Johnson's Wax are constantly revising their packaging lines. In this article, this company's industrial engineering manager reviews their basic approach to packaging line layout, cites effective solutions to a number of specific packaging line problems.

PROBLEM... **Apply Cellulose Bands At Packaging Line Speeds At Minimum Cost**

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SPARKLETTE DRINKING WATER CO.
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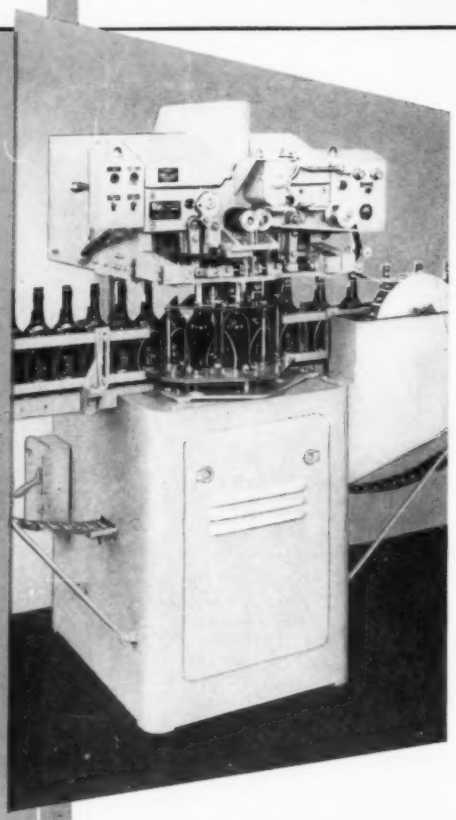

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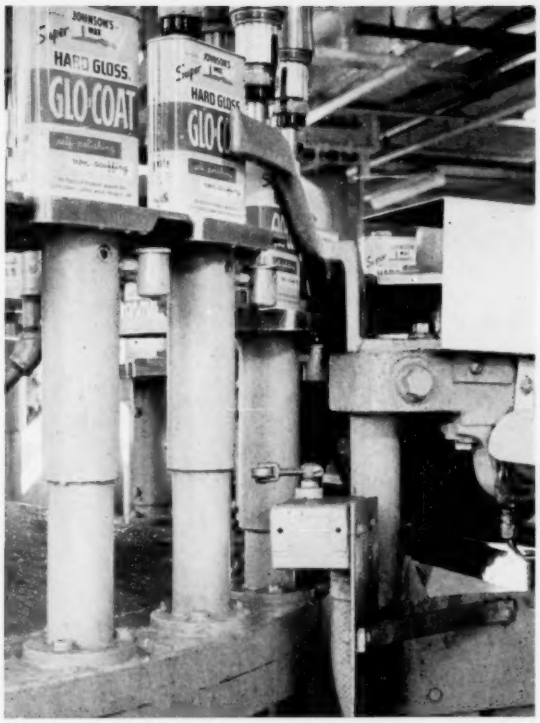
CHARLES E. SHERWOOD has been associated with Johnson's Wax since 1937, when he graduated from Cornell University with a degree of chemical engineering. As industrial engineering manager he is responsible for packaging and processing equipment layout, methods in processing and packaging as well as standards. He is a member of the Society For Advancement of Management and of Packaging Institute — and is a member of the Midwestern Section of PI's production line committee.

To eliminate foaming Johnson engineers installed a round, silicone-coated fiber brush — which the filling tips contact as they rotate. The small amount of silicone on the tip breaks the foam immediately upon contact. Before solving the problem of foaming, it was necessary to provide space on the line for wiping the tops of cans. Now, brush eliminates problem in all of Johnson's water base products.



When a platform sticks and does not lower, this micro-switch actuates to stop the machine, as seen here. Another micro-switch application is in the installation of the level control. If product flow fails and the level in the bowl becomes low the micro-switch actuates and the filling machine stops. The float used in connection with it supplements the pneumatic liquid level control.

Packaging lines at Johnson's Wax are not static and must be very flexible to meet changing requirements. The degree of required flexibility may include the need to run bottles as well as cans, or at least provision so that the packaging line can be converted with a minimum of rearrangement, and adequate space to handle various types of combination packs and consumer deals as merchandising plans may dictate. The ideal condition for the most efficient, highly mechanized, high speed line — constant running of the same product and size — is met in the case of only two of our ten lines. The other lines must handle a variety of containers and sizes.

PLANNING COMES FIRST. There is one major objective for any packaging line. It must produce the volume and quality demanded by sales at the most economical cost. There are a great many ways in which to achieve efficiency on the packaging line. Proper planning of the package itself must come first. Selection of the most effective equipment must be next. Consolidation of different products on the same packaging line, often achieved by minor changes in the equipment used, can provide a combined output that justifies the installation of more fully automatic or improved equipment.

A good layout permits the use of high speed equipment, makes for efficient handling, permits flexibility in operation, realizes the maximum productivity from the operators, provides accessibility for ease of maintenance, and contributes to good housekeeping. Efficient packaging line layouts can be achieved in single story or multi-story buildings. Multi-story buildings present somewhat more of a problem and require a little more ingenuity and usually slightly higher equipment costs.

TYING TOGETHER EQUIPMENT. Once the package itself is decided upon and the equipment selected, the problem resolves itself into that of arranging and tying together from six to nine different pieces of equipment, usually from as many different manufacturers. In dealing with a high speed automatic line, the importance of tying together the individual pieces of equipment cannot be overemphasized. Each machine is designed to perform one or two separate functions. Theoretically each function is carried out effectively by itself, but an efficient line is one in which the combination of functions is carried out with a minimum of operators, a maximum of quality, and at as high an output as possible.

To achieve this end, the layout planning must go beyond merely locating the various pieces of equipment and transporting from one operation to the next. It must include devices for inspection, devices to protect equipment and to detect jams,

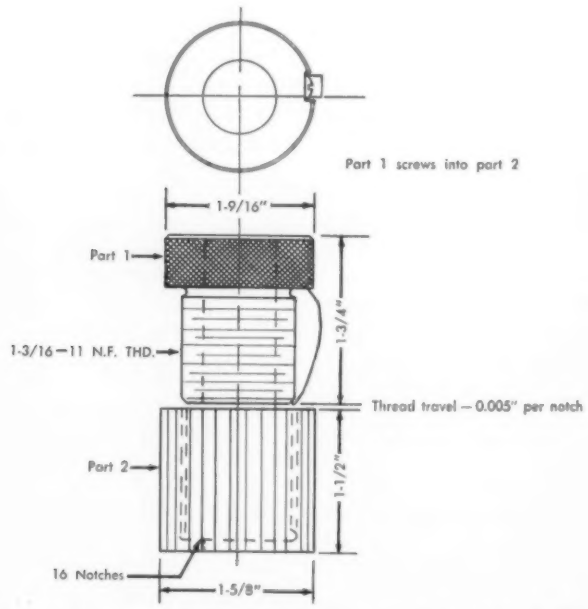
and the means to transfer packages smoothly from one operation to the next. The higher the speed of the line, and the more fully autmoatic it is, the greater the importance of the above. At outputs of 200 or more containers per minute, it takes very little lost time to amount to thousands of packages of lost production in a day.

Avoid Over-Mechanization

There is one point that should be stressed in the selection of equipment for a high speed, fully automatic line. In the search for more and more automatic lines and higher production speeds one must be on the guard against over-mechanization. While equipment that is higher speed and more automatic may bring about reduced costs, there is the compensating factor that each additional piece of equipment in a line is another source of lost time. The more complex the equipment the greater the likelihood of lost time and the larger the amount. The objective to be achieved by a particular piece of equipment should be pin-pointed and this objective attained in as simple a manner as possible.

STRIVE FOR SIMPLICITY. If it is desired to check-weigh filled shipping cases, a simple alarm device indicating light weights may be adequate, and a more complex system that automatically ejects the occasional light case from the line may add nothing more to the effectiveness of the line. It is also desirable to reduce the number of moving parts wherever possible. In handling oblong cans we have found that the conventional grippers on a rotary capper are not necessary.

If the cans are introduced smoothly and positively by a worm feed, a simple metal guide will control the cans through the capper and the grippers that close and open to grasp individual containers can be eliminated. (See photo 1.) In this connection, the suggestions of maintenance and operating personnel should be sought. In fact, one of the most important approaches to good line layout is to confer with maintenance and operating people at an early stage in the planning. Fewer difficulties arise during the installation of the equipment and, in many cases, worthwhile suggestions are forthcoming.



To reduce lost time on high speed lines, the Johnson organization produced this adjustable spacer. This permits a line operator to adjust fill on the individual tubes of a gravity filler while the machine is running, meeting the need of having to change spacers in filling tubes to correct fill.

HAVE ENOUGH SPACE. One of the first considerations in laying out a packaging line is to be sure that adequate space is available and that packaging supplies can be introduced to the line in such a manner that congestion in the packaging area is minimized. The use of templates for the various pieces of equipment simplifies the preliminary planning of the layout. Our installations at Johnson's Wax are in multi-story buildings. Packaging supply storage areas are located on second and third floors, with the faster moving items stored in second floor areas. Material handling to and from packaging lines should be minimized as much as possible to avoid interference and congestion.

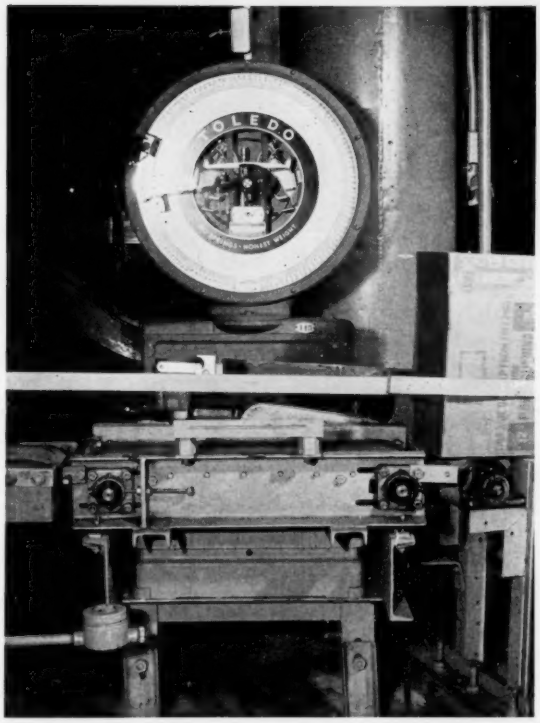
With this end in mind, we introduce as many supplies as possible from the storage floors. Empty cans are conveyed down from the second floor, glass bottles in reshippers are also conveyed from the upper floor, and caps are dumped on the second floor into large hoppers superimposed on the regular capper hopper. Filled shipping cases move from the end of the packaging lines to overhead conveyors that transport them to palletizing areas and to trucks and cars. The movement of pallets in the packaging area is minimized as much as possible.

Laying Out Line

We make it a practice to lay out our can lines in a straight line. By providing adequate space, we can convert one of these lines to a bottle line by adding another leg and making a U shaped line. The bottle dumper, labeller and bottle cleaner are located in this additional leg. Filler, capper, case gluer and compression unit remain fixed, and with the replacement of the can case loader with a bottle loader the glass line is complete. On a glass line, the labelling machine is our biggest source of downtime so that we label before filling and provide an accumulating table between labeller and filler.

PROBLEMS OF LABELLING. The labelling machine is run somewhat faster than the filler, and the excess

This simple arm does an effective job of turning cans 90 degrees, according to Mr. Sherwood. Engineers worked out this arm after trying unsatisfactorily to do the job of turning these oblong cans with a rotary can turner. To detect any can that may be improperly turned there is a feeler arm passing over nozzles. If no nozzle is felt when a can is in place a micro-switch stops the case packer.



Because no visual attention takes place (the case packers are fully automatic) there is a checkweighing scale for cases. This scale is sensitive to within four ounces so that it readily detects a missing can or a gross underfill and sounds an alarm bell. Shipping cases move slowly enough for this checkweighing to be effective; the occurrence of off-weight at this point is infrequent.

supply of labelled bottles is accumulated to be fed back into the line to prevent momentary shut-downs of the labeller from stopping the line. This is a make-shift arrangement and one that we are striving to overcome through more reliable wraparound labelling. An alternative is to provide two labellers in parallel, but careful analysis of lost time must be made, and as many sources eliminated as possible, before this can be justified.

One of the problems in effective layout is to provide adequate, but not excessive, distance between pieces of equipment. In the interest of conserving space these distances should be as short as possible. If the machines are shut down manually in case of trouble, there must be enough room for back-up of containers so that preceding machines are not jammed. On an oblong can line, running 210 containers per minute, we have all machine controls located just after the capper. On the packaging floor there is one operator on this line and she controls the starting and stopping of filler, capper, automatic case loader, gluer and compression unit.

How problems arise. We introduced a bottom code dating machine between capper and case loader and found that, in the event of case loader difficulty, the cans backed up into the code-dater so fast, at 210 per minute, that the operator had too little time in which to make up her mind and shut down the code dater, as well as the capper and then the filler. This is an example of the type of problem that arises in laying out a line where increasing speed and decreasing human attention eventually come into conflict. Later in this article, in discussing future possibilities in our line layouts, we will explore what can be done in this direction.

The matter of smooth transfer of containers into and out of machines is extremely important. We have found the most positive timing and control results from using worm feeds on both the filler and capper. These space the containers into the intake star wheels and eliminate jams in the star wheel that occur without the worm if the containers are not solid on the approach conveyor. The use of worm feeds helps in shortening up the space between these two machines. Filler and capper are specified so that we can run one conveyor through the two machines, thus helping to reduce the number of dead plate or cross-over transfers. This is particularly important on glass lines to reduce the impact of bottles on the line.

Filling Machine Changes

We have several 28-head gravity fillers in operation and by increasing the available gravity head, we have been able to increase our filling speeds from the previous 150 to 165 units per minute up to 180 to 210,

depending upon the product characteristics. The conventional float type control in the filling bowl controlled the liquid level to within ± 3 inches. By replacing this with a standard pneumatic level controller, the level is held within ± 0.5 inches. A sleeve was added to the filling bowl itself increasing its height from the original twelve inches up to eighteen inches.

ANTICIPATE HIGH SPEEDS. The combination now gives an effective liquid level in the bowl of close to seventeen inches compared to the six inches that we had previously. With the same diameter filling tubes the fill cycle is increased in proportion to this increased head and we can fill faster than 210 per minute when we are able to improve our can feeding, which has now become the bottleneck. Relatively simple changes can often greatly improve output, and in laying out a packaging line this fact should be recognized and the layout itself planned for a higher output than is initially contemplated, wherever the added cost is small.

The package itself, of course, can have considerable effect upon the layout and the efficiency of the line. We are not going into the many aspects in this article, but in connection with high speed filling, and the use of as large a diameter filling tube as possible in gravity filling, a can nozzle that is rolled to the outside eliminates any chance of a burred edge causing the can to hand up on the tube.

SOLVE FOAM PROBLEMS. Some of our products tend to foam considerably and this has been a problem, particularly on half gallon and gallon oblong cans. It affected line layout because, until we found a solution, we had to provide space on the line for wiping the tops of the cans. The installation of a round, silicone coated fiber brush, which the filling tips contact as they rotate, eliminates the problem in all of our water base products. The small amount of silicone on the tip breaks the foam immediately upon contact. (See photo 2.)

To reduce lost time on high speed lines, because of the previous need to change spacers in the filling tubes to correct fill, an adjustable spacer was made which permits the line operator to adjust fill on the individual tubes of a gravity filler while the machine is running. (See drawing.)

Planning For Controls

Micro-switches and photo-electric controls are a necessary adjunct to any high speed, automatic line. With the exception of a few that come on specific pieces of equipment, the planning of the layout must include the determination of what is needed on the line in the way of special controls. Many inspection details can be handled by special detection devices and other devices can detect malfunctioning of equipment. Specifically, some of the problems that must be handled are improper fill because of low level in the filling bowl, filler platforms that stick and do not lower, containers that hang up on filling tubes, containers without caps or with loose caps, oblong cans improperly turned going into automatic packer, low supply of shipping cases in case magazine on packer, cases without full complement of containers or with partially filled containers, and case jams entering the take-away conveyor from the sealing unit.

NEED CLOSE INSPECTION. The reduction of personnel on the line to the point where one or two people handle the entire line, with the exception of feeding containers to it, means that most inspection must be done by other than human means and, at increasingly high speed operation, mal-function of any machine must be detected immediately.

In addition to the pneumatic liquid level control in the filler bowl, an ordinary float is installed in connection with a micro-switch. If product flow fails and the level in the bowl becomes low the micro-switch is actuated and the filling machine stops. Occasionally one of the filler platforms will stick and not lower. A micro-switch is mounted as shown in photograph 3 to stop the machine in this event. Loose caps are run off by contacting a bar with rubber fastened to it. A permanent magnet mounted over the line picks up the loose cap and a feeler arm beyond this point actuates a micro-switch and an alarm bell when a container without a cap passes.

ARM DOES JOB. After working with a rotary can turner to turn oblong cans 90 degrees going into automatic case loaders, and not getting satisfactory operation, a simple arm was installed on the conveyor that does an effective job. (See photo 4.) In order to detect an occasional can that may be improperly turned, a feeler arm passes over the nozzles and, if a nozzle is not felt when the can is in place, a micro-switch is actuated and the packer stopped.

With fully automatic case packers operating on oblong cans, there is no visual attention at this point and a case checkweighing scale is used. (See photo 5.) It is sensitive to within four ounces so that a missing can or gross underfill is detected. The shipping cases move slowly enough, and the incidence is infrequent, so an alarm bell is sounded. We are using top and bottom sealers to seal our end-opening cases of cans so we have to turn and drop the cases on their bottoms upon leaving the compression unit. Occasional jams occur at this point so a photo-electric cell with a time delay relay is used to sound an alarm if a jam occurs.

Locating Trouble Quickly

As mentioned earlier, we are beginning to run into the problem of controlling a line when trouble develops at any one spot. At high speeds, trouble backs up quickly into preceding machines. A point is reached when one operator cannot react quickly enough to make the decision and execute it. There is also the desire to further improve productivity by getting this operator off of the line. One possible solution is a completely synchronized line, involving a counter shaft from which all machines are driven. Overload switches, or other controls, would shut down the entire line in case of trouble at any one spot.

DETECTING OF JAMS. Another possibility is to tie all of the machines in sequentially with jam detection devices. We are working along the

latter lines now. The approach we are taking is to place at the feed point of each machine a photo-electric jam detector which, when a jam occurs and the containers back up, will stop the preceding machine. The containers will back up at the feed to this second machine and another jam detector will shut down the machine before it.

Starting at the point of trouble, each machine will be shut down in sequence back to the first machine. When the original jam is cleared that machine will start automatically and each machine preceding that point will start in succession.

Using Limit Switches

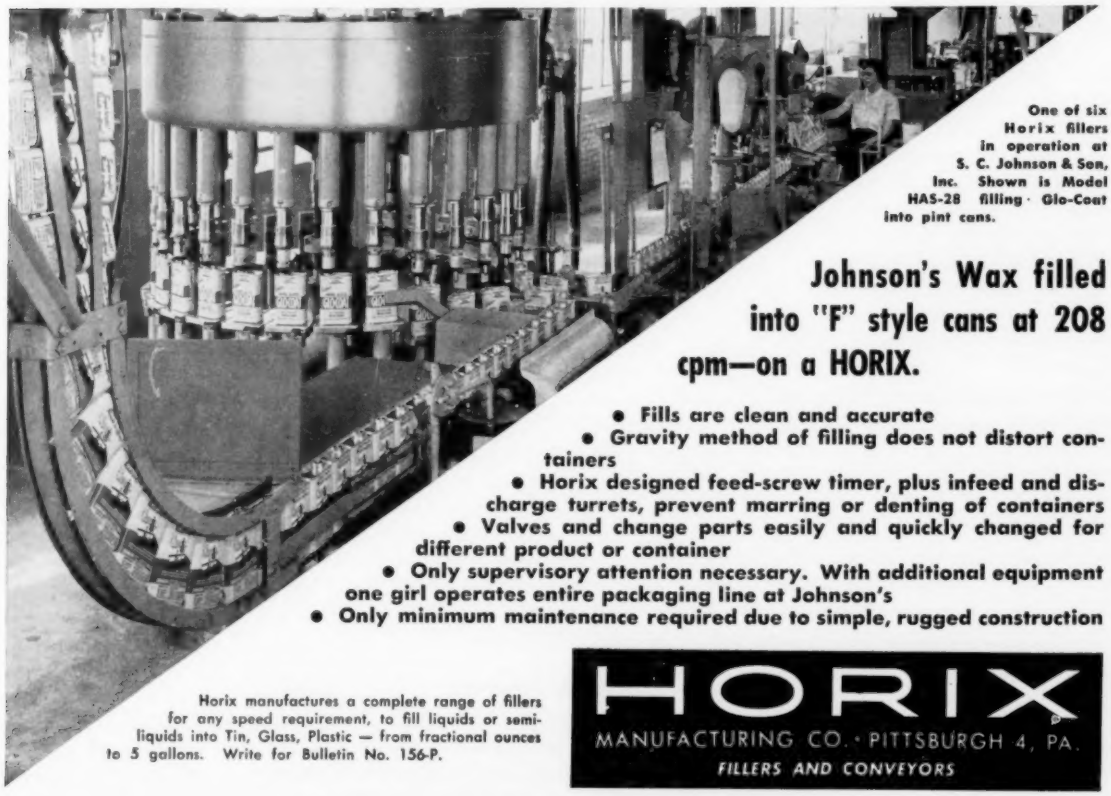
As discussed previously, there are various limit switches along the line to monitor such things as low level in the filling bowl, a container without a cap, an improperly turned can going into the case loader, etc. If one of these switches operates, indicating a mal-function, the machine on which it is mounted will shut down.

How it works. If, for example, a can leaves the capper without a cap, the no-cap limit switch will operate and stop the capper. This will cause the capper jam switch (or flood switch) to operate and shut down the filler. When the mal-function has been corrected, the start button must be actuated to start the machine where the mal-function occurred. This will clear the capper flood switch and automatically start the filler.

All relays and devices which can be remotely operated are mounted on a central panel and wired to a common set of terminal blocks. All interconnections are then made by means of jumpers on the terminal blocks. This technique permits fast trouble shooting when the trouble occurs. We are working on the first installation now and through this means we hope to further increase productivity by increasing line speed with fewer operators than we now have. We also anticipate that it will permit the shortening of our lines.

Editor's Note

Mr. Sherwood's searching, analytical review of his experience and that of his associates and his company emphasizes one of the basic purposes of Package Engineering: To provide an interchange of information and know-how. Close contact with our readers enables us to locate material of this caliber and value — as you find in this issue and future issues. But if you have an idea for such an article and we haven't yet gotten to you, please contact us. We always have an ear to the ground for a lead to top quality editorial material. Please write us — we invite your suggestions, since this is *your* magazine. — R. B. H.



One of six Horix fillers in operation at S. C. Johnson & Son, Inc. Shown is Model HAS-28 filling Glo-Coat into pint cans.

Johnson's Wax filled into "F" style cans at 208 cpm—on a HORIX.

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FILLERS AND CONVEYORS

Unmixing: a phenomenon whose explanation may solve obscure packaging mysteries

By Laurence V. Burton
Consulting Editor, Package Engineering

Here is a penetrating analysis of a little known phenomenon whose explanation leads to the solution to many apparently inexplicable packaging problems. In this article Dr. Burton traces some of the underlying factors that explain why there are variations in height *of fill—even though each container receives a uniform* amount *of fill. His discussion of unmixing points the way to further research in some basic problems affecting quality control and uniformity of packaging.*

Some queer things that knock quality control for a loop have been known to happen immediately before or during packaging operations. They are difficult to understand or diagnose, but their cause is a frequently observed but little comprehended behavior of certain types of dry materials. A Chief Engineer of a munitions plant was fired during the war because he could not find a way to produce a molded plastic object of uniform quality. Admittedly his molding job was not a packaging job, but the same unrecognized prineiple was the cause of his downfall.

For want of a better name the principle will be called *unmixing*. An erroneous, but popular, belief is that when dry materials are once thoroughly mixed they will remain mixed. Yet all are doubtless aware that vibrations of a barrel of potatoes transported over a very rough road will bring the small ones to bottom and the big ones to the top. This is an example of unmixing that must have been known for centuries, but few persons are aware of its significance in packaging.

BECAME PACKAGING PROBLEM. Very recently the production manager of a chemical works faced the same disaster that overtook the chief engineer, above. This time it was manifested as a packaging problem. The company's biggest customer threatened to cancel all his business and go elsewhere unless the packages he was buying were uniformly filled. He was not content that each package held the declared net weight. He wanted each package to be filled to the same height.

There was no complaint as to the product itself; it was wholly satisfactory. But there was a very considerable difference in the *apparent* amount of product in the 18-ounce cartons. You can easily understand the buyer's attitude. He had contracted with the chemical manufacturer to produce a household chemical and put it into packages. The product was new and the distributor was trying to introduce it into a highly competitive market. He was spending large sums for advertising and sales promotion.

VARYING FALL HEIGHTS. But he was frequently receiving complaints that housewives found many partially filled packages even though each package actually held 18 ounces. So the matter of uniformity of fill was put up to the chemical manufacturer, but the production manager and his associates were unable to stop the variations of height of fill, let alone find out what was causing them. The buyer then served notice that he would cancel his contract and go elsewhere.

The product was made by rather ordinary chemical manufacturing methods. Then it was spray dried, cooled, conveyed to a packaging line and filled into cartons by a gross-weight filler. His problem was another manifestation of unmixing, only this time it was due to unmixing of powder and small hollow spheres.

Long A Problem

Unmixing is nothing new. The first recorded instance of its importance in industry occurred about 1910 at the Rumford Chemical Works. Quality control had found that the composition of the baking powder was not always running uniform. A standard teaspoonful did not always give off the same volume of carbon dioxide. No one could ascertain the cause of the variations.

Even the production vice president performed the batch weighing operations himself and had his figures checked by other officers, but the occasional variations would occur. Finally research discovered the hitherto unrecognized prineiple of unmixing and proved that it could actually take place *in the mixing machine!*

Research also found that each of the 5,000-pound capacity mixers had an individuality and that each machine had an optimum mixing time that differed from the other mixers.

CLOSE TIME CONTROL. Also it was found that the optimum mixing time must be the end of the mixing operation for, if it were exceeded by as much as a minute, it required about

another half-hour of mixing to get back to the uniformity of dispersal at the first optimum. If the second peak were overrun it was necessary to operate for another 30 minutes to reach the optimum again. Once this point was established there was no more trouble.

Dr. Charles A. Catlin (who worked out the problem that had been discovered by routine quality-control testing) found that the unmixing phenomenon took place where two or more dry, free-flowing powdery materials of markedly different densities were agitated. Also that it did not occur where the several components of the mixture had approximately similar densities. (For details and a suggested method of computing the dispersion, see "Queer Things That Happen in Mixing", by L. V. Burton, *Food Industries* 5, 390, 1933.)

Effects of Particle Size, Density

There is more to it, however, than was discovered by Dr. Catlin. Analysis of coal samples from a big pile will usually show a higher sulphur content around the edges of the pile than at its top or center. Engineers have found that this is caused by the fact that lumps of coal having the highest sulphur content are more dense, i.e., heavier, than normal coal, and when they fall onto the pile from a conveyor the heavier lumps have a tendency to roll farther down the cone that builds up.

IT'S STILL UNMIXING. Thus, the high-sulphur coal tends to segregate at the bottom and outer edges of the pile. But it is a manifestation of the principle of unmixing. Similarly if bank-run, dry gravel is dumped from a conveyor onto a pile, the larger stones have a tendency to roll down the sides of the cone. Therefore, there will be a greater concentration of large stones at the bottom edges than elsewhere, particularly at the top of the pile.

Both of these ordinary phenomena are apparently caused either by differences of particle size or particle densities when the mixture is given a chance to roll down hill, either in the slow moving mixing machine or where the mixture is allowed to fall freely and form a cone.

Free Fall Creates Problems

The chief engineer lost his job partly because he had never heard of unmixing and partly because he unwittingly permitted free fall. The electronic cores were intended for use in very complex military equipment and absolutely uniform and perfect magnetic characteristics were indispensable if the cores were to pass individual acceptance tests. The cores were of a very simple shape, molded from a mixture of a thermo-setting resin and powdered iron of high purity.

UNMIXING, FREE-FALLING. Unhappily, government inspectors were rejecting over 70 per cent of the cores because the iron powder was not uniformly dispersed in the finished article. The tragic tale of the chief's futile efforts to lick the problem is too long to repeat here, and the only reason for recounting part of the story is that it is an excellent case history of the troubles caused by the combined action of unmixing and free falling. Everything he tried came to naught.

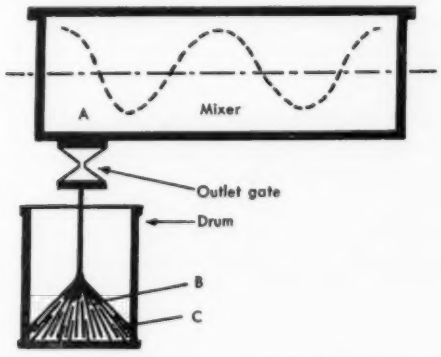
According to his story, the material in the mixer, after a certain period of operation, was properly mixed—which may or may not have been an accurate observation. But even if it were properly mixed, the free fall from the outlet gate of the ribbon type mixer to the bottom of the fibre drum in which the resin-iron mixture was transported to the molding presses would have been enough to undo much of the mixing accomplished in the machine.

CONCENTRATIONS SHIFT. That any of the cores passed inspection was remarkable. Figure 1 shows a diagram of one of the trouble spots. To anyone who comprehends how unmixing takes place it is obvious that the higher concentrations of the heavier component will be found at the sides of the drum, and that the material in the center will be somewhat deficient in the heavy component.

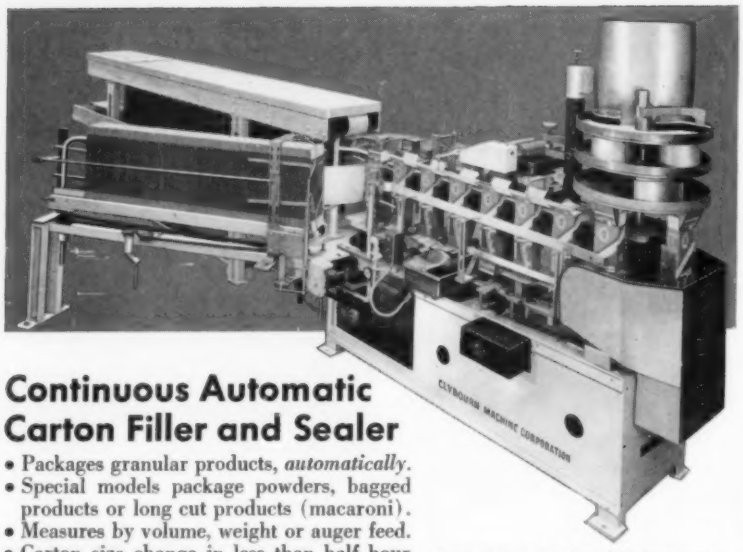
If it is true that the mixing of the material in the machine were properly done, and that the unmixing took place afterward as a result of the free fall, then the remedy for it would be very simple. He could have used a large diameter flexible hose from the outlet gate to the bottom of the receiving drum. The hose could have been made of canvas or cloth. The main thing would be to prevent the mixture from falling freely, and never allow it to form a cone in the drum, or to pour anywhere if it could be avoided.

Long Fall Affects Filling

In the case of the chemical manufacturer it was found that a hopper tank about ten feet deep, was located above the filler, and that the product was dumped from a conveyor into the big hopper, falling a distance of from six to eight feet, depending on the height of material in the hopper. The product was drawn off at the



A typical trouble spot involved in a problem of unmixing occurs with a free fall situation as shown here. Difficulties may arise in the mixer (A) or in the cone (B) built up by the free fall. Or, they may arise in the accumulation (C) where the deficiency is in the upper part of the pile due to higher concentrations or heavier components accumulating at the sides of the drum.



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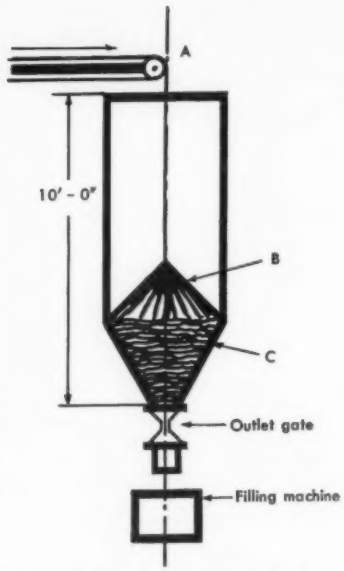

Where a product falls several feet (such as from the end of a conveyor) and builds up into a cone (B), difficulties may occur. What can happen is that large particles tend to collect or build up, such as at (C) the base of the cone. When the cone is formed by material falling into the hopper, the bulkier (not the denser) particles seem to segregate around the sides of the hopper.

bottom of the filling machine beneath.

The spray-dried material appeared to be granular but under a microscope it was seen to be actually composed of a large proportion of hollow spheres not over one mm. in diameter. When the cone was formed by the material falling into the hopper, the bulkier (not the denser) particles seemed to segregate around the sides of the hopper. (See Figure 2.)

UNIFORMITY LACKING. Dry, free-flowing powdery materials in a bin or tank do not settle uniformly when drawn off at the bottom. Material nearest to the opening will come out first, followed later by material nearer to the sides. Hence the apparent density could not be uniform and, even though packages holding exactly 18-ounces are filled from the hopper, it should be obvious that the filling heights could not be uniform.

Two possible remedies would have avoided the problem: (a) use of a large flexible hose to prevent free falling of the product; or (b) cut out the hopper tank (which happened to be there and was inconvenient to move) and convey the product directly to the

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filler. But avoid free fall at all costs!

When Unmixing Is Important

It is desirable to understand the principles of unmixing for the problem has much wider application than the foregoing examples. Many times it occurs unnoticed and without ever causing any harm or trouble. So far as it is known, unmixing is important ONLY if the conditions hold as follows:

1. When the test-quantity is relatively very small as compared to the total mixture: e.g.,
   (a) 1 teaspoonful of baking powder taken from a 16-ounce package which in turn was taken from a 5,000-pound batch.
   (b) A 2-ounce electronic core from a 700-pound batch.
   (c) An 18-ounce package of the chemical taken from an estimated 3,000 pounds in the hopper tank.
2. There is considerable dissimilarity in density or particles of a dry, free-flowing solid, e.g.,
   (a) Sodium bicarbonate vs monocalcium phosphate.
   (b) Plastic molding powder (density of about two to three vs. powdered iron (density of about seven).
   (c) Chemical (densities unknown) ranging from solid granules to hollow spheres.
3. Movements of the mixture are such that it can somewhere roll down an incline. The more dense or the bigger particles always seem to roll farthest and collect there. This appears to be true whether it takes place in a ribbon-type mixer or by falling free onto a pile.
4. The components of the mixture are dry, free-flowing, granular or powdery solids.

If the problem seems quite incomprehensible, consider the job of mixing and maintaining a uniform mixture of popped corn and BB shot.

Pharmaceuticals' Unmixing Problems

While the phenomenon has apparently not been carefully studied in the pharmaceutical field, it has been privately reported that there is a strong possibility that unmixing may be the explanation of certain unaccountable variations in composition of certain drugs where there simply could not be an error! Batches of mixtures of powders may be as large as 200 to 400 pounds composed of several dry components.

FACING UNMIXING. They are thoroughly mixed in a mixing machine, compressed into small tablets or filled into gelatin capsules, and placed into bottles or set-up paper boxes. Quality control is more exacting in the pharmaceutical industry than in any other place, and the sample for the exacting assay is usually the single dose, either one tablet or one capsule. Of course, replicate analyses are made. Thus, all the conditions exist in pharmaceutical manufacturing whereby the phenomenon of unmixing might be a problem.

Should inexplicable variations of composition or bulk density of powdery or granular, dry, free flowing solids be found, it is possible that the cause is unmixing. Conversely, if free falling is a normal materials-handling technique, what happens here might deserve scrutiny from the quality control angle. The phenomenon is not often met, and it is not always important. But it is very perplexing, although the remedy is almost absurdly simple.

Who Will Take Up This Study?

The problems of unmixing in a machine that is actually operating, or the separating of unlike particles by rolling down a steep hill, are understood only empirically. They deserve a thorough-going engineering study. They could constitute an excellent project for a thesis. — L. V. B.

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How we pump liquid wax to our filling machines

By Clyde McKerlie
Chief Engineer, Chicago Plant
Hawthorn-Mellody Farms Dairy

Hawthorn-Mellody Farms Dairy wanted to avoid individually supplying its Pure-Pak machinery with liquid wax—and wanted a way to keep the wax at correct temperatures. E. B. Kaiser Company, Glenview, Illinois, piping systems firm, engineered a way to do these things. In this story, the plant's chief engineer reviews the operation of this system, summarizes the results of his plant's extensive experience with it.

Taking wax directly from tank cars is a basic feature of this system, so that there is no manual handling of wax from tank car to filling machinery. Upon receiving a car, and before removing its wax, the first job is to connect a steam line to the car. This melts the wax—which usually solidifies while in transit. Here, Mr McKerlie is checking his line.

This heat exchanger is a single-stack, center-flow unit, thermostatically controlled for maximum temperatures. Hot water circulates constantly through the system—to attain and hold proper temperatures for wax. An important feature of the Ebko system is the use of jacketing at all points with no exposed areas along piping.

To deliver a uniform flow of liquid wax to our battery of six Pure-Pak machines we found a way to pipe our wax from tank cars, through storage and holding tanks, to a central control point. By using an engineered system of piping, jacketed lines and heat exchange we are able to move this wax in such a way that we properly control its temperature. Use of this system eliminates manual handling of wax and eliminates separate feeding of wax supplies to individual Pure-Pak units.

ARRIVAL OF CARS. For our waxing operation we use No. 200 dairy wax. This reaches our plant in tank cars, shipped by our various wax suppliers. Since it usually takes a car seven or eight days to move from a supplier's plant to our own, the wax is usually solidified upon arrival—particularly during cold weather. This is true even though these tank cars are insulated. Therefore, usually the first thing we do after spotting a car is to hook up a steam line to the car, using about 50 pounds pressure, receiving the steam through jacketed piping.

READY TO TRANSFER. We do this in order to melt the wax, to prepare it for transfer through our system. During cold weather it takes about twelve hours to do this, somewhat less during warm weather. Once a car of wax is melted to a liquid, it goes through jacketed lines from the car unloading point to 10,000-gallon storage tanks—heated with water. It is all-important to keep the wax from solidifying during this transfer.

LINES FULLY JACKETED. For this reason a vital feature of our transfer system is the complete jacketing of lines through which liquid wax moves. There are no exposed points anywhere along these lines. Likewise, tanks are insulated and jacketed. Hot water constantly circulates through the system in order to subject wax to proper temperatures and to prevent its losing these temperatures. This prevents solidification.

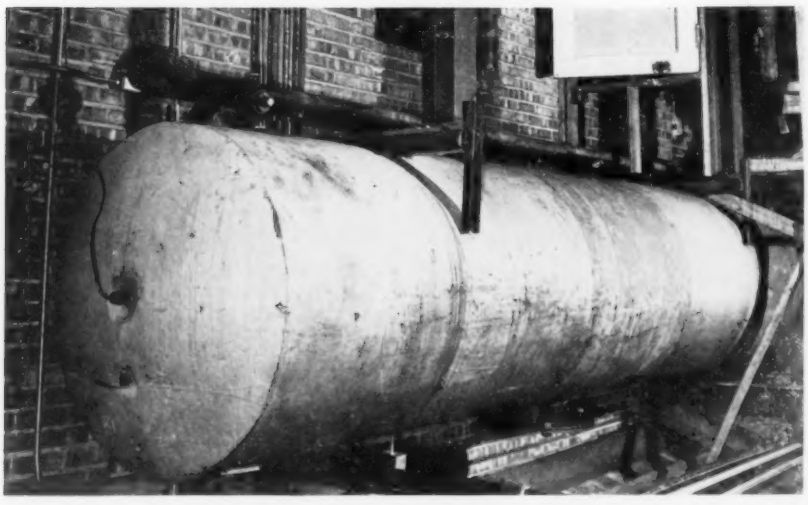
KEY TEMPERATURES. In storage we try to hold our wax at temperatures from 145 to 150 degrees F. At higher temperatures the wax starts to oxidize and may give an off-flavor. However, it keeps well at this 145-150 degree range. When the wax moves from a storage tank to a 1500-gallon holding tank (which thus holds 7000 pounds of wax, enough for a day's run) our system raises the wax temperature to 160 degrees. Since wax remains here only a day, it is safe for us to keep it at a figure as high as 160 degrees. An Ebko suction type tank heater heats the overhead tank.

RAISING THEM UP. Next phase of the operation is to raise the wax temperature so that wax goes into our Pure-Pak machines at approximately 165 degrees. Once in one of these machines the wax temperature again rises—so that the actual application temperature is about 175 degrees. We usually hold this application temperature, plus or minus one or two degrees. If cartons themselves are cold, the wax application temperature is less than normal. On a hot day, for example, the application temperature is slightly above normal.

WATER DOES IT. Use of hot water and a heat exchanger system assures adequate heat to boost and maintain these wax temperatures. There is a single stack center flow heat exchanger thermostatically controlled for maximum temperatures. For example, to raise the wax temperature from 165 to 170 degrees, the water

Clyde McKerlie has been chief engineer of the Chicago plant of Hawthorn-Mellody for 14 years. Prior to that he was associated with the International Dairy organization. After receiving a public school education he secured his advanced education through night courses, combined with practical experience. A licensed pilot, he regularly flies his own airplane. He also devotes some of his "off-duty" hours to his own machine shop.

Enough for a day's run, there are 1500 gallons of wax in this holding tank. In this tank the wax temperature is around 160 degrees; since wax remains here only a day, there is no danger in exposing wax to this temperature. Usually, storage temperature is 145-150 degrees; at higher temperatures wax starts to oxidize, may give an off-flavor.



temperature goes to about 177 degrees. Since the system is fully coordinated, not only the lines and tanks but all other points are fully protected by heat—to prevent any dropping of wax temperatures. This hot water is constantly circulating.

A CENTRAL FLOAT. An important feature of our system is a central float that governs the level of wax in each of the filling machines. All six of our machines are leveled with relation to each other, so a single float maintains a common level (about 40 inches above the floor) at these machines. Originally there was a separate float for each machine, but we replaced these with a central float—which is jacketed.

WAX MEETS CARTON. Leaving the float, the liquid wax goes into the Pure-Pak equipment through a short length of pipe that is not jacketed. This is the only point in our system where unprotected piping is used. We can not jacket this because of the movement of other parts of the machine in the vicinity of this pipe. However, this causes no difficulty and does not impair our operation.

SELECTIVE USE. Our system permits us to deliver wax to all of the machines or any of them selectively. Each machine has a shut-off valve; shutting off any one machine does not impede movement of wax into the other units of our Pure-Pak battery. Further, at the end of a run each evening, at attendant shuts off the flow of wax into each machine.

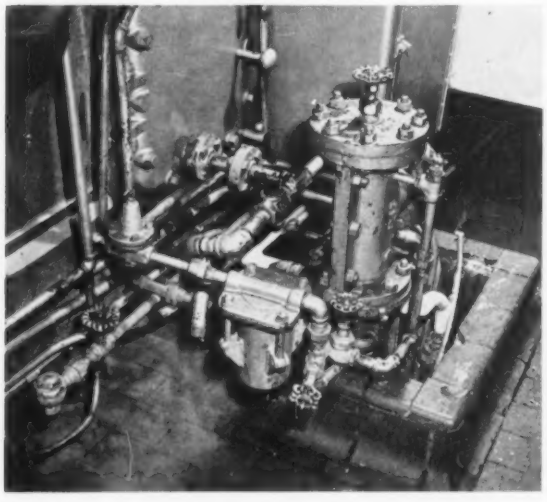
KEEP UNITS DRAINED. All the attendant does at night is to shut off the flow. Next morning each unit is drained. We let the wax stand overnight to settle and we do not drain until morning. We have to keep our system drained because of the moisture inherent in the wax. By doing this we are sure of starting with a clean system every morning. There are draining points to permit removal of moisture. The water, being heavier, settles in the bottom of the piping and is easily drained off.

HEART OF SYSTEM. Thus, we deliver the contents of a car of wax (which, incidentally, gives us about a ten-day supply for our Pure-Pak battery) to our machinery. All-important to the success of this system is the complete jacketing of pipes. With an exposed or unjacketed spot, wax would solidify and form a plug at that point. This is particularly true during moments when wax is dormant rather than in actual circulation.

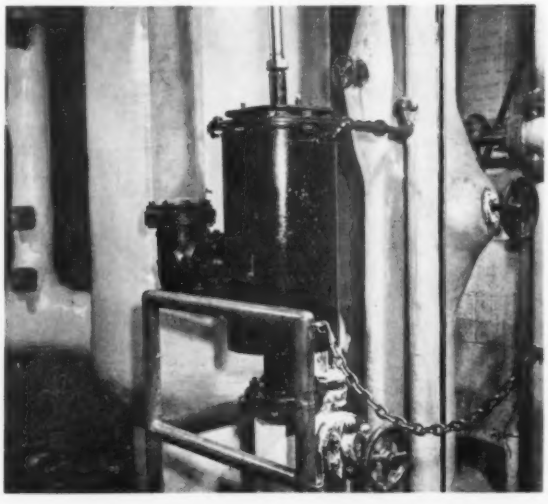
Chief Engineer McKerlie Lists Key Points In Piping Of Liquid Wax:

1. Be sure your jacketing is complete—to prevent any exposed points at which wax would solidify.
2. Watch your storage tank and holding tank temperatures—in order to maintain the quality of your wax.
3. By leveling your machines you can use a central float to serve them all.
4. Let your wax stand (to settle) overnight before you drain it in preparation for your next run.

Serving all six filling machines, this central float controls level of wax at each of the Pure-Pak machines. Since all of these machines are levelled with relation to each other, this one float does the job. Another feature of the system is that any or all machines may be in operation, thus permitting selective equipment usage.



At each filling machine the liquid wax enters through one of these units. Temperature of wax is about 165 degrees when it enters a machine. Within the filling unit its temperature raises so that actual application temperature is about 175 degrees. At the end of a day's operation, an attendant shuts off the flow, to permit draining.



News of Packaging Personalities

Dr. John H. Truesdail is now assistant plant manager, Pigsah Forest, N. C., plant of the Film Division, Olin Mathieson Chemical Coporation, in charge of polyethylene production.

Joseph C. Mertes succeeds **Dr. Truesdail** as technical service manager. Mr. Mertes was previously quality service supervisor. He will remain at Olin Mathieson's New York office.

Robert D. Elkund is now a midwest sales representative of the Olin Film Division. He was previously associated with Prudential Insurance Company at Indianapolis.

Edward A. Johnson is now film engineer in technical service for the Olin Film Division. He was previously associated with Colgate-Palmolive Company, Jersey City.

Dr. C. Richard Calkins is now director of research of Riegel Paper Corporation at its four mills in New Jersey. He has been with Riegel's technical staff since 1949.

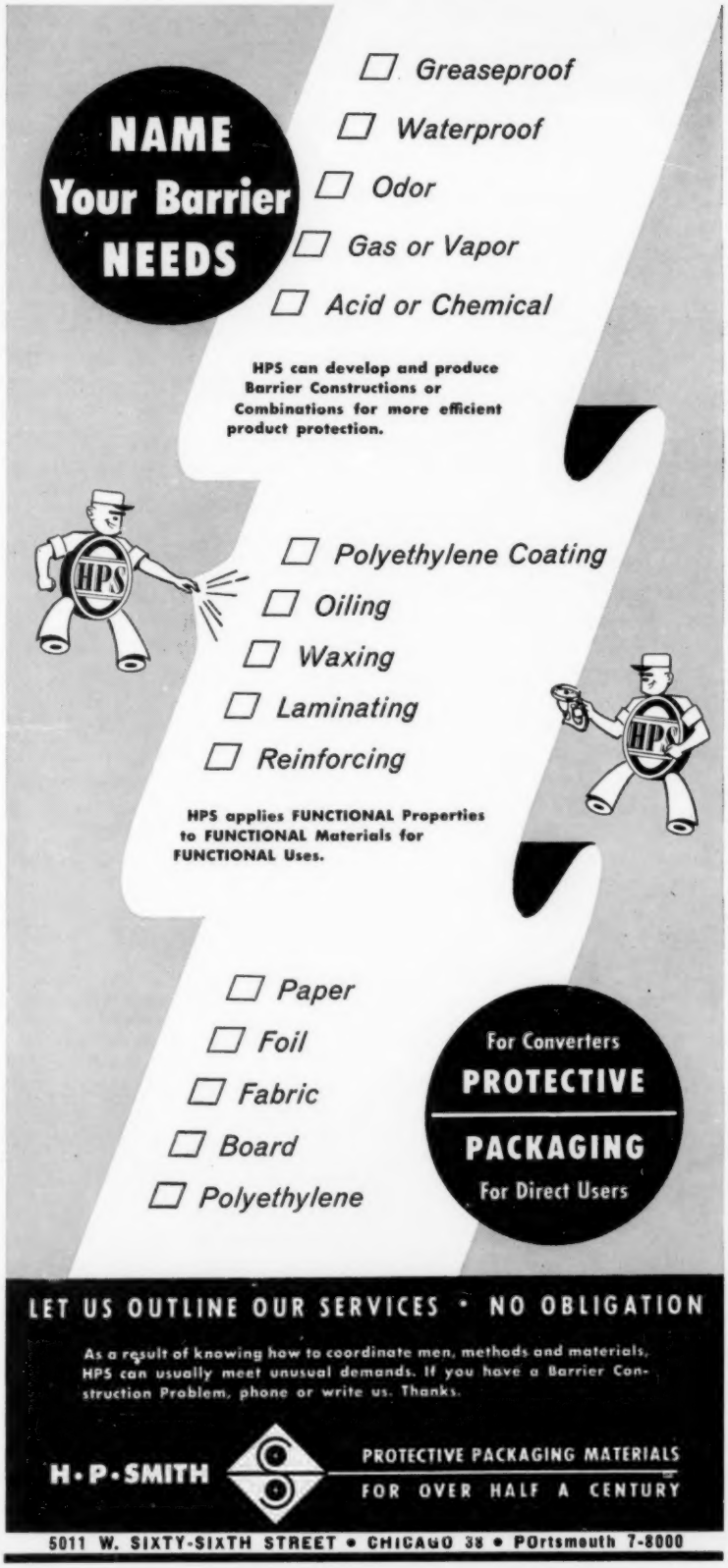
Alexander M. Turner, a vice president of Owens-Illinois Glass Company, is now also general manager of its Libbey Glass Division. He succeeds **Harry J. Durholt,** also an O-I vice president, who is now a consultant to **Hugh C. Laughlin,** executive vice president.

William J. Stewart is now director of personnel administration, a post previously held by Mr. Turner. Mr. Stewart was previously chief industrial engineer of O-I's administrative division and general manager of the Kaylo Division of O-I.

Edward A. Randlett is now Southern and Southwestern closure and plastics manager of O-I, with headquarters in Memphis. Previously he was Western closure and plastics manager, located in Chicago.

R. M. Curtis is now Western closure representative. Previously he was assistant service manager of O-I's Glassboro, N. J. plant.

(Continued on Page 45)



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Bunte Brothers Chase uses one line for many different items

Where extreme diversity of production prevents full mechanization of packaging lines, a plant (1) modifies its machinery to fit the needs of the personnel on the line and (2) capitalizes on their skill by training them to do one thing while they watch another. This story tells how Bunte Brothers Chase Candy Company attains these objectives, reveals how it gets benefits of specialization by packaging related products on a single line.

Prior to packaging these jelly candy items go through a screening to remove excess sugar, fractional pieces and doubles. Upon entering this Triangle unit the candy rides in specially designed flights, on Teflon-coated belts — both of these features to avoid mashing of candy.

Specially designed take-away belts carry filled bags from the Triangle equipment to the weighing and closing operations. This combination of belts and the angles used facilitates handling of bags by girls working on succeeding operations; they can thus pick up these bags more easily.

By assigning one of its packaging lines to a single product group (its jelly candy items) Bunte Brothers Chase Candy Company, Chicago, gets top production through specialization of both equipment and personnel. Since this plant produces an extreme variety of candy items its packaging line operations have to be both specialized and versatile at the same time. Running a group of related products on one line is one of the ways by which Bunte Brothers Chase attains this dual objective.

Product Problems

On a year-around basis the plant's jelly candy line packages nine items ranging from small drops to large pieces (and in various flavors) in bags ranging from eight ounces to two pounds. In addition, this line (like others in the plant) handles a number of special or seasonal items —such as holiday novelties. Result is that a single packaging machine may handle from 30 to 50 different candy items.

NEED HOLDING TIME. Not only does this product diversity prevent Bunte Brothers Chase from using such techniques as direct conveyorized flows of candy to packaging machines but also the product itself creates a problem. The jelly items receive a steaming application which means that a standing or holding time prior to packaging is necessary. Usually these products stand one day before they move into the packaging machinery.

These jelly items arrive at the packaging line in flat wooden trays (called "candy catching boards") which stack up on trucks prior to transfer of their contents. En route from trays to the packaging machine hopper, they go through a screening. This removes excess sugar, eliminates fractional or broken pieces and holds out doubles — two pieces stuck together. Thus, a uniform product goes into the packaging operation.

Machinery Modifications

Although the Triangle unit has basically the standard action typical of such machines, Bunte Brothers Chase has modified it to meet the special needs of jelly candy packaging. There are special belts on which the candy rides, in order to avoid mashing these items — which are inherently soft. Further, belts are Teflon-coated and there are specially designed flights on the machine.

CANDY SIZE NEEDS. Because some of the jelly items are relatively large pieces, plant engineers and technicians modified the dribble feed channels and operation. They did this to meet the weight requirements of the larger candy pieces. A major machine change is that of the delivery belts for carrying away bags filled with candy; the plant did it to provide easier and faster bag handling.

This modification involves two belts — each mounted on an angle. Filled bags ride on one belt and are held in partially upright position by the other. Having these belts (and used at this angle) means that it is easier for girls to pick up bags than would be possible with alternative conveying methods.

Trained For Speed

Another feature of Bunte Brothers Chase packaging operations is that line crews specialize so that girls develop speed and efficiency in handling a particular type of product. The girls attending the jelly candy line are skilled at handling these items. As a result they learn to work fast with each of the jelly products. For example, when the checkweighing scale indicates a given deficiency, these girls know exactly how many

She adds pieces to bring bag to correct weight. Because girls can add pieces easier and faster than they can remove pieces the filling equipment is adjusted to give either precisely or just under the correct weight. In this way girls never have to take out pieces to attain correct weight.

Watching her scale as she heat seals the preceding bag (already checkweighed) her mind registers just how much to add to get correct weight. Then, when she goes to fill bag seen here on scale, she knows at once how many pieces to add. Girls become skilled at knowing how much to add of each piece.

pieces of a product to add — to bring the weight up.

ADD, NOT SUBTRACT. There are two girls assigned to checkweighing and bag sealing. Each has an Exact Weight checkweighing scale and a Wrap-Ade heat sealing unit. The way in which they use these units shows how Bunte Brothers Chase develops trained, fast crews. The heads of the Triangle unit are adjusted so that they deliver bags with the exact weight "on the nose" or slightly less than precise measure, with a typical speed of 30 bags a minute.

Reason for this is that it is easier and faster for a girl to *add* product than to remove pieces in order to get a correct fill. In this connection the girls develop efficiency because of the sequence they follow. A girl puts a bag on the scale, then heat seals the bag previously removed. As she is sealing this bag she is looking at the scale to note the weight of the bag on the scale. When she puts down the sealed bag she instantly inserts the needed pieces into the bag just weighed.

Completing Of Packages

In this way, machinery modifications and manual techniques coordinate to get peak production. Since the belts deliver bags in such a way that a girl can pick them up quickly, she gears herself to work efficiently on the other jobs of completing each package. In making her heat seals she develops a technique, so that she gets each seal in just the right place — not too far in or out. A typical sealing temperature is 240 degrees F.

LOADING OF CASES. As the two girls complete their individual bags they put these on a conveyor leading to the case loading point. Here, a girl fills each case, glues and closes its flap and puts the sealed case on a conveyor leading to a truck loading station. The girl loading cases not only has a supply of stapled cases within reach but the corrugated separators are already in place. All she does is load bags and insert a paper sheet before closing each case.

Thus, just four girls operate the jelly candy line. One attends the Triangle equipment, two checkweigh and heat seal and the fourth loads and seals cases. Supplies of empty bags (made in the plant on a battery of Simplex equipment) arrive at the Triangle in open boxes — ready for use. These bags are of 300 MST and 450 MST cellophane, usually, although Bunte Brothers Chase uses some polyethylene bags. Weight of either film used depends on package size as well as on individual piece sizes.

Production Planning

To avoid downtime due to changeover, the plant tries to schedule production so that a line such as this operates at least a full day on one item. Because of special promotions being packaged as well as product and package size changes of regular items careful scheduling is necessary to assure as long runs as possible. As an aid to improved movement of product before and after packaging, Bunte Brothers Chase is now developing a major change of floor plan.

PACKAGING BATTERY. Presently, the various product packaging lines occupy segregated areas on the main packaging floor. Soon, these packaging lines will be relocated so that all of the principal machines stand together in a battery. This will enable one stock attendant to keep a large number of machines supplied with product. Other benefits of consolidated location include easier takeaway of finished goods and less movement of personnel.

Scales and sealing units stand in tandem position so each girl has a checkweighing scale and a heat sealer within easy reach — as well as a supply of candy being packaged. Completed bags move down belts to case loading station of line, where a girl loads and closes cases for discharge to storage.

This Story Gives You Three Shortcuts To Faster Checkweighing:

1. Use specially-designed belts to carry filled bags to checkweighers so that they may pick up bags quickly and easily.
2. Set your machines so they must add (rather than take out) product to get desired weight.
3. Teach each checkweigher to look at the scale holding the *next* bag to be sealed while she is actually sealing a bag already checked. Then when she puts down the sealed bag she quickly adds the right amount to the next bag before sealing it.

ONLY TRANSWRAP

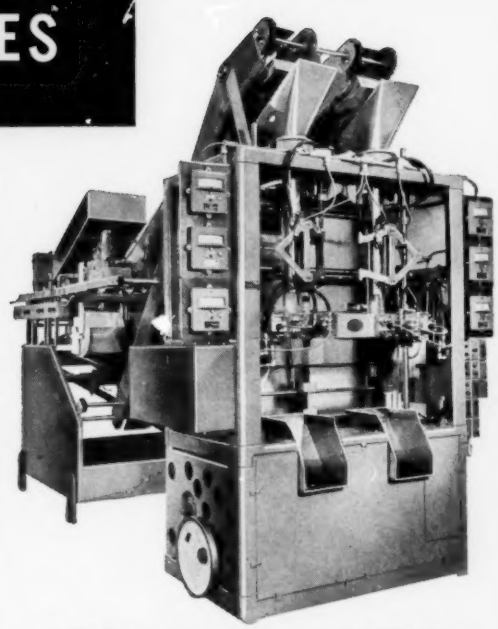
Gives You Completely Automatic Packaging

WITH THESE NEW DESIGN FEATURES

Now available: 10 major new design features in the Model C Transwrap. You benefit from nearly a year's redesigning—the kind of engineering updating you expect from Package. Check these new features and see how much *more* Transwrap gives you.

- *Simpler Design*—Operation has been simplified. Fewer parts are used for more efficient, high-speed packaging.
- *New Sealer*—Unique resistance-type sealing and more accurate temperature control permits the use of the latest films—like polyethylene and vitafilm—speeds operations.
- *Improved Cut-off*—New mechanical knife will give complete single, alternating or perforating partial cut-off.
- *New Electric Eye*—Redesigned electric eye mechanism means accurate registration of printed materials.

Model C Transwrap will produce up to 45 packages a minute in bag sizes from 2 7/16" to 9 7/16" wide and 4" to 14" long. It handles fine powders, granules, semi-liquids, liquids and free-flowing solids. To find out more about all the new Transwrap features, write or phone our nearest office.



Model C Transwrap shown is for low head-room installations. It features floor-level feeder and automatic transfer unit.

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PACKAGE MACHINERY COMPANY

Announcements of machinery and products

1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
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4. Then, *mail* the card — we pay the postage.

Feeder, Counter Unit

U. S. Engineering Co. reports that its latest unit, the Electronic Feed-A-Matic, feeds and counts such items as plastic

beads at speeds exceeding 4,000 a minute. A photo electric pick-up head does the counting. Dials control preset count — up to 100,000. Circle No. 1.

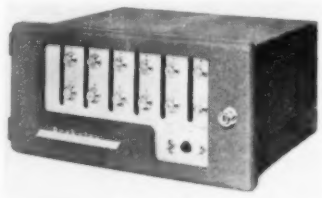
Imprinting Equipment

Pitney-Bowes, Inc. announces a new imprinting machine that feeds, imprints and power stacks folded cartons, bags,

tags, envelopes, et al, at a rated speed of 10,000 an hour. Using rubber mat or metal type, this unit imprints areas up to 4" by 18". Circle No. 2.

Magnetic Counter

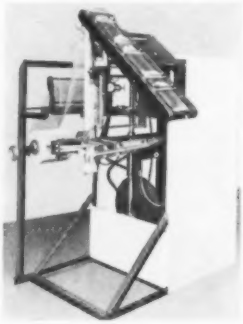
Beckman Instruments, Inc. says its new preset controller is capable of counting up to 10,000 counts a second, giving



precise control of high-speed weighing, batching, packaging, et al. Heart of this unit is a miniature wirewound magnetic amplifier. Circle No. 3.

Packaging Machine

Mercury Heat Sealing Equipment Co. reports that its Verti-Pak converts roll stock film into bags, filling and heat



sealing them. Speed ranges from 30 to 50 a minute depending on bag size (3" to 10" long by 2" to 9" wide), handling wide range of product sizes, shapes. Circle No. 4.

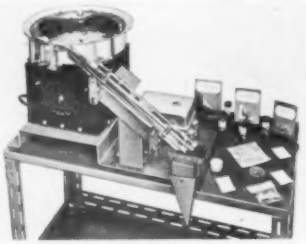
Carton, Tray Former, Gluer

Peters Machinery Co. describes its new carton and tray forming and gluing machine as capable of speeds of 175

or more a minute. Handling top-opening or hinged cartons or trays, the unit adjusts to sizes from 6" to 18" long, 6½" to 19" wide. Circle No. 5.

Counting, Filling Machine

Brown Bag Filling Machine Co., Inc. says its new Vibracount facilitates handling of limited volume packaging by



providing semi-automatic counting and feeding—up to 30-35 packets a minute. Handles such items as screws, washers. Circle No. 6.

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Square *RE-USABLE* Metal *Pad-Kaging* Containers

ELIMINATE majority of handling and storage problems

REDUCE shipping weights and cubic footage

These RE-USABLE Metal Pad-Kaging Containers were developed by PETERS-DALTON for the U. S. Armed Forces. They have been approved and are in use for shipping and storing innumerable items.

P-D Containers eliminate the storing of many cumbersome and highly inflammable materials—they also eliminate the excess labor usually required in packaging such items as delicate radar instruments. Older methods caused finished packages to be heavy and bulky. They were susceptible to breakage and penetration to moisture and fungus. They were wasteful because of their excessive use of man-hours and materials, culminated by the eventual scrapping of the expensive packaging. Also, when reshipping was required, old fashioned containers after having once been opened, were seldom satisfactory for adequate repackaging of the materials — endangering them to damage while in transit. These inadequacies and limitations have been virtually eliminated through P-D RE-USABLE Metal Shipping Containers,

* * *

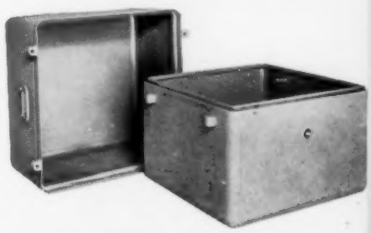
Features include: Lightness: Completed packs weigh far less than older style types. Compactness: The P-D RE-USABLE Metal Containers frequently save more than 50% of cubic footage. Economy: Material and man-hour outlays for packaging are reduced 25%.

Special Features: Containers are equipped with air fill valves to eliminate dangers of fungus or moisture and dial type humidity indicators. Drop handles furnished for containers weighing less than 200 lbs.—heavier containers have been designed for fork truck lifting. Extremely simple to close, only ordinary bolts (4 on the smallest container to 14 on the largest) are required; the simplest of hand tools perform the closing or opening operations. Optional: Pressure relief valves to equalize inside to outside pressures.

* * *

These RE-USABLE Metal Containers were manufactured by PETERS-DALTON for items ranging from aircraft engines, electronic parts, to large A-N containers in all types and sizes for shipping purposes. Complete engineering and manufacturing facilities are at your disposal for design, testing and fabricating. We'll be glad to tell you more—just write, wire or phone.

Materials formerly used in packaging one light military electronic item.



Only two parts to handle.

P-D Re-Usable Container ready to be closed and sealed. Note the simplicity of design.

STEEL SHIPPING CONTAINER DIVISION

Peters-Dalton INC.

A SUBSIDIARY OF DETROIT HARVESTER CO.

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- Industrial Washing Equipment
- Drying and Baking Ovens
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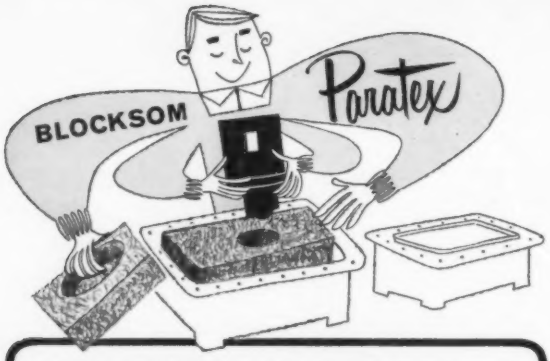
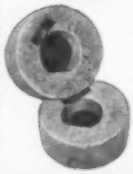


SPEEDS SHOCKPROOF PACKING UP TO 50%

Pre-cut or custom molded *Paratex* dunnage saves up to half or more of your packaging time while providing the utmost security for delicate instruments. Add these savings to *Paratex'* low initial cost and you'll see why *Paratex* is the number one choice with re-usable container shippers.



FREE Engineering Service

We'll design your *Paratex* rubberized curled hair shipping pads in the right density, molded to shape to meet your exact needs at no extra cost to you! (Also available in flat sheets or die-cut to fit your requirements.)

Call or write for free sample and complete information to

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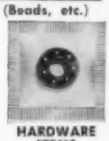
WRAP-ADE
high-speed UNIT PACKAGERS

WRAP-ADE Unit Packagers are versatile, low cost machines designed specifically for faster packaging with less waste. They perform an entire cycle of packaging operations including feeding, filling, forming and sealing practically every type of heat sealing materials.

SAMPLE PACKAGES

NOVELTIES (Beads, etc.)



HARDWARE ITEMS

FOOD PRODUCTS

UNIT PACKAGER with CONVEYOR FEED

For some packaging operations, this manually fed conveyor is the ideal feeding system. Among products adapted to this system are small textile products, flat food items, toys, bandages, or any other reasonably flat small product. *Other Unit Packagers available for almost any small item.*

Send us a sample of your product today for our prompt quotation.

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Manufacturers of Packaging Machinery for over 20 yrs.

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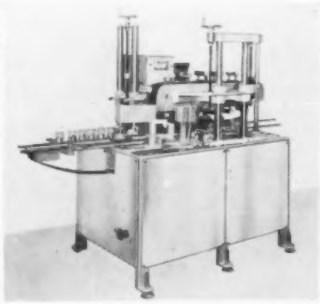
Automatic Labeling Machine

The MRM Co., Inc. reports that its labeling machine (for glue or thermoplastic labels) has special features to assure



even coating, holding of containers for exact registration and fast change-over, as well as adjustment of upper feed mechanism. Circle No. 8.

Electric Stapler

The Staplex Co. announces a new hand-fed stapler to handle bag closing, stapling bags to cards, et al. It acti-

vates when work goes into it, runs as an operator feeds work to it. Stapling position adjusts to 9¼". Circle No. 7.

Case Closing, Sealing Unit

The Hinde & Dauch Paper Co. reveals its new equipment for closing and sealing one-piece slotted corrugated boxes has

a bottom flap closing mechanism that eliminates the work of putting the product in the box, as the box is put over the product. It has a powered flap closing unit. Circle No. 9.

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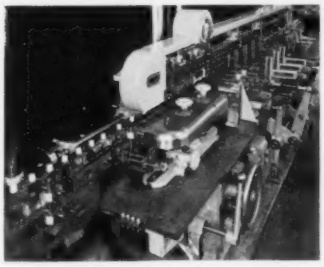
Front And Back Labeler

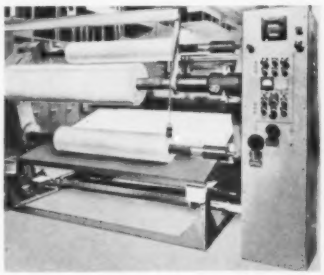
Pneumatic Scale Corp. Ltd. announces its new Tri-Matic labeler automatically applies front and back labels at speeds



up to 180 containers a minute. Straight-through intake feeds three bottles at once. Pressing stations wipe down labels. Circle No. 10.

Three-Shaft Turret Winder

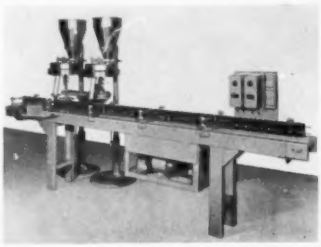
Hobbs Manufacturing Co. says its new unit winds a web continuously under controlled tension to rolls of pre-



determined diameter up to 36", and notes that uniformity of tension eliminates distortion. Circle No. 11.

Dry Product Filler

Stuyvesant Engineering Co. reports a new automatic multiple head filler for dry, semi-dry, free or slow flowing prod-



ucts, filling rigid containers up to 240 a minute. It can operate to put two different products into the same container. Circle No. 12.

Have you changed your job or moved to a different plant? Fill out the Change of Address Card and send it to us.

NEW TYPES OF PATAPAR PROVIDE MOST EFFECTIVE GREASE-PROOF BARRIERS EVER OFFERED!

Positive control of grease and oil penetration

STOP "CRAWL"

New types of Patapar—Oil or grease will not spread or "crawl." NO penetration.

Conventional grease-resisting paper — Note spread and "crawling."

The test: place drops of oil on the new grease-proof Patapar Vegetable Parchment. The drops remain on Patapar's surface indefinitely in little globules. The oil does not spread or crawl. There is no penetration.

These new Patapars offer you a revolutionary LOW COST way to package products having high content of grease, fats or oils. Their effectiveness has been proven with bacon, lard, shortening, margarine, hams, sausage and many other products.

HIGH WET-STRENGTH, TOO

They have the same permanent high wet-strength that is inherent in all the many types of Patapar Vegetable Parchment. And they are odorless and NON-TOXIC.

EXCELLENT PRINTING SURFACE

Because of Patapar's rich, clean, white texture, outstanding printing effects are obtained. Our plants are specially equipped for printing by letterpress or offset lithography. Patapar printing service includes artwork, typography, engravings — everything needed.

SEND FOR SAMPLES — tell us the application you have in mind and we will send brochure of samples together with technical information.

Patapar®
Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

OTHER PATERSON PRODUCTS
*PATAX waxed paper
*DURAPAK parchmentized cellulose
*PATERSON absorbent paper
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PATERSON PARCHMENT PAPER COMPANY
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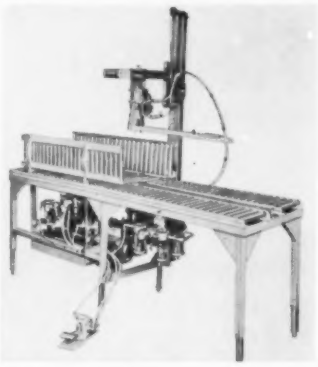
West Coast Plant: Sunnyvale, California

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

Box Stapling Machine

Container Stapling Corp. announces a new unit that simultaneously staples tops and bottoms, using air-operated



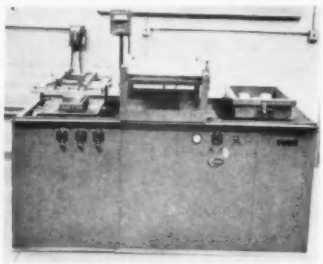
heads with valves operated by mechanical means. It handles center slotted corrugated and fibre boxes, operating without electrical equipment. Circle No. 13.

Automatic Can Sealer

Resina Automatic Machinery Co., Inc. announces a new can sealer, running 60 cans a minute up to quart size — slower on gallon cans. This unit receives cans from a filler, without manual handling, uses the standard one-inch seal. Circle No. 15.

Vacuum Forming Machine

Vacuum Forming Corp. says that its new VacForm unit is self-contained, permits simultaneous two-way vacuum and



drape forming, with both male and female molds. A single heater lets one operator handle drape forming and vacuum forming at once. Circle No. 14.

Printing Cylinder Expander

Mosstype Corp. reports an improved expander for applying heat to the ends of D-Mount sleeves — in mounting or demounting plate cylinder. A thermostatic control accelerates and limits the heating action. Circle No. 16.

Differential Colorimeter

Manufacturers Engineering & Equipment Corp. announces a new unit for measuring differences between colors, with an improvement in sensitivity when measuring dark samples. New features include a digital reflectance indicator. Circle No. 17.

Multiwall Bag Construction

St. Regis Paper Co. announces development of a new principle of bag construction: Putting structural strips of kraft paper between two walls of heavy duty multiwalls, thus reinforcing gusset areas and bag edges. These strips at points of stress replace use of entire plies. Circle No. 18.

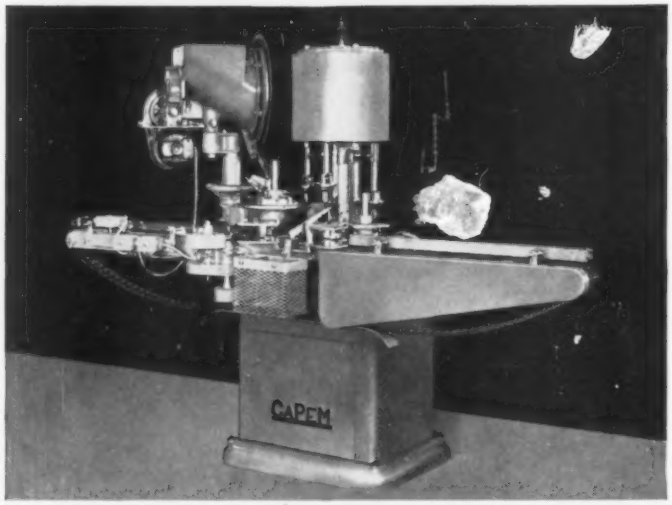
Inert Barrier Film

Bakelite Co. reports that W. S. Shamban & Co. uses its fluorothene resins to produce a Califilm, a barrier 0.004" thick, designed to withstand corrosive chemicals as well as toughness and flexibility. Tensile strength is described as being about 25,000 pounds psi. Circle No. 19.

Plastic Bottle Lining

Plax Corp. announces development of a series of linings to permit use of plastic bottles with products previously unsuited to such packaging. Barrier effect of linings reduces permeation of essential oils, prevents contact with bottle walls. Circle No. 20.

CAPEM THE MODERN SCREW CAPPER



- Applies any type of standard screw cap or cover at speeds of 2,000 to 10,000 per hour.
- Takes container from conveyor line, applies cap perfectly, and returns container to conveyor AUTOMATICALLY without intermediate handling.
- Handles bottles, jars, cans or jugs of any size or shape.
- Delivers a perfect, LEAKPROOF seal at low cost.
- Available in 1, 2, 4, 6 and 8 spindle models.

Write for prices and delivery

CONSOLIDATED PACKAGING MACHINERY CORP.
Buffalo 13, New York

CECO MODEL 40 ADJUSTABLE AUTOMATIC CARTONER

SPEEDS PACKAGING . . . CUTS COST
HANDLES WIDE RANGE OF CARTON SIZES

Here, in a low cost machine, are all the automatic features found only in the most expensive cartoners. No other horizontal loading machine, at any price, offers such versatility, low-cost operation and low upkeep as the CECO Model 40.

Handling the carton automatically from hoppering through closing or sealing, with the product inserted manually, the Model 40 provides a great saving in time and labor. One user reports a 54% saving in labor, with 6 operators cartoning as many pieces as 13 operators did by previous methods. Depending on the size of the carton, the CECO Model 40 will produce up to 40,000 sealed cartons per day with only one operator.

These advantages, and many more, mean substantial reductions in your packaging costs. Why not get the full money-saving details today? *Write for illustrated brochure.*

The CECO Model 40, like all CECO Glue Sealers and Cartoners, is a self-contained unit, mounted on casters for easy portability. Models are available to tuck both ends, or glue seal both ends, or tuck one end and glue seal the other. It can be used as a set-up machine to close one end only. It automatically produes clean, square, strong cartons at lowest cost.

CONTAINER EQUIPMENT CORPORATION

MEMBER, PACKAGING MACHINERY MANUFACTURERS INSTITUTE

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Testing Equipment

E. J. Cady & Co. pamphlet gives details and illustrations of its line of precision instruments for checking of basis weight, bursting pressure, bulking or thickness. It enumerates specific applications of instruments. Circle No. 101.

Wrapping Machinery

Hudson-Sharp Machine Co. catalog gives 16 pages of details and applications of its Campbell Wrappers, illustrating equipment and products which each packages. Line drawings show functional features of machines. Circle No. 102.

Permeability Details

Glassine & Greaseproof Manufacturers Assn. chart lists water vapor permeability of 17 different packaging materials, as determined by TAPPI Standard Methods, with information arranged in tabular form for easy comparison. Circle No. 103.

Automatic Banding Machine

Economic Machinery Co. Bulletin BA-168 sets forth details of the World automatic cellulose banding machine. Series of line drawings illustrates exact sequences—with both plain and printed bands. Circle No. 104.

Polyethylene and Chemicals

Durethene Corp. seven-page bulletin has a list of chemicals that indicates whether or not polyethylene resins may be used with them—and at specific temperatures. List ranges from acetaldehyde through zinc sulphate. Circle No. 105.

Case Gluing, Taping Machine

Clybourn Machine Corp. Bulletin No. 10 enumerates (with illustrations) features of its case gluing and sealing machine, including model specifications and illustrations of controlled glue application. Circle No. 106.

Can Seaming Machinery

E. W. Bliss Co. Catalog 36B, Section 5 gives details and illustrations of double seamers and side seamers for medium and high speed can lines, including applicable can sizes for each machine. Circle No. 107.

Packaging Adhesives

Swift & Co. pamphlet on packaging adhesives reviews range of packaging applications for which its adhesives are available, together with pertinent suggestions where choices are involved. Circle No. 108.

Tablet Counter

The Lakso Co., Inc. has an illustrated explanatory bulletin describing its latest machine, the "48" tablet counter, with machine features charted and named on bulletin, as well as special features. Circle No. 109.

Rubber Plate Letterpress

Paper Converting Machine Co. has a four-page pamphlet reviewing its new six-color rotary rubber plate letterpress, with illustrations pointing up key control features of this equipment. Circle No. 110.

Heat Sealing Equipment

Vertrod Corp. eight-page bulletin describes the features of its hand, foot-pedal and power-operated models of thermal impulse heating sealing machinery, including discussion of thermal impulse heat sealing process. Circle No. 111.

Silicone Release Agent

Dow Corning Corp. has a pamphlet explaining how its silicone release agent keeps films, waxes and products from sticking to packaging, labeling and processing machinery, and reviews properties of the agent. Circle No. 112.

Auger Filling Machinery

Stokes & Smith Co. Folder No. P-802 gives details and illustrations (with line drawings) of its auger filling machines for granules, powders and pastes — with machine specifications and package limits. Circle No. 113.

Packaging Machinery

Pak-Rapid Inc. has a four-page folder describing the features of its line of equipment to form, fill, heat-seal and deliver flexible packages automatically. Illustrations show different machines as well as range of packages formed. Circle No. 114.

Imprinting Unit

Markem Machine Co. offers a descriptive sheet setting forth details of its equipment for imprinting partially preprinted die-cut roll labels and rewinding them for use with packaging machinery. Circle No. 115.

Marking, Coding Equipment

Adolph Gottscho Inc. has a four-page folder describing and illustrating how its packaging, marking and coding attachment works, how it operates in connection with packaging line equipment, and illustrating specific applications. Circle No. 116.

Humidity Controller

American Instrument Co., Inc. Bulletin 2273 reviews basic features and operating details of its electronic humidity control equipment, with illustrations, drawings and a chart showing how to select sensing elements. Circle No. 117.

Protective Papers

Thilmany Pulp & Paper Co. "Fact File" contains 22 concise, illustrated packaging applications of its treated papers and combinations, along with description of basic products of its line. Circle No. 118.

Unit Packaging Machinery

Wrap-Ade Machine Co. brochure discusses details of equipment to handle items ranging from powders to nails and screws, using heat-sealing materials. Circle No. 119.

Cartons and Machinery

Robert Gair Co., Inc. has an illustrated booklet that comprehensively reviews various styles of folding cartons and dis-

cusses a range of machinery with which to handle these cartons. Circle No. 120.

Filling Machinery

The Filler Machine Co., Inc. offers a folder describing details of its new straight line filler for semi-liquid and semi-solid products, reviewing speeds and mechanical details. Circle No. 121.

Cartoning Equipment

R. A. Jones & Co., Inc. has a four-page bulletin reviewing its automatic and semi-automatic cartoners, with illustrations and descriptions, as well as itemization of range of products these machines handle. Circle No. 122.

Flexible Packaging Machinery

Simplex Packaging Machinery, Inc. Bulletin SOM-IR describes this company's automatic machinery to form, fill, seal and check-weigh bags, also covering speeds and operative details. Circle No. 123.

Skin-Tight Wrapping

Amsco Packaging Machinery Corp. has a folder describing the Twistite/Shrinkwrap Method of wrapping meat, poultry and cheese products of irregular shapes, and reviewing details of equipment used for this operation. Circle No. 124.

Casing Machinery

Food Machinery & Chemical Corp. offers a bulletin describing its package casing equipment, including specifications and operating details, for loading rigid and semi-rigid packages into cases automatically. Circle No. 125.

Protective Papers

Central States Paper and Bag Co. has a brochure reviewing case histories of applications of paper to protect metal, wood and plastic finishes against abrasion, et al, paper being made into bags, tubes or sheets. Circle No. 126.

New Cellophanes

American Viscose Corp. Bulletin 3178 discusses three new types of cellophane added to this company's line, reviews other grades available, and presents a table showing ratio of yield to thickness. Circle No. 127.

Vegetable Parchment Papers

Paterson Parchment Paper Co. has a folder describing (including samples) various grades of vegetable parchment papers resistant to moisture, oil and grease, and used for packaging items from food to automotive parts. Circle No. 128.

Emulsions for Films

Polyvinyl Chemicals Bulletin A-1 describes a series of polyvinyl acetate emulsions suitable for use in the wet strength films and remoistenable films field. Circle No. 129.

Pliofilm Details

The Goodyear Tire and Rubber Co., Inc. has a brochure explaining Pliofilm characteristics and illustrating its uses. It includes a physical test data table and an end-use chart facilitating film selection. Circle No. 130.

(Continued on Page 45)

Are your literature and catalog files up to date? Do you have the latest material? The industry literature offered in this issue will go far in bringing you up to date. Why not send for it now? Use our postcard to do so. You will be glad you did — the material offered can be valuable to you.

Compare or Verify THICKNESSES of Packaging Materials

BOXBOARD • PAPER • FOIL
FELT • PLASTICS • GLASS
Direct Reading • Extremely Accurate

Cady Exact Hand Model Micrometer Shown Designed for Portability; Other Models available . . .

- **Desk and Lab Micrometers**
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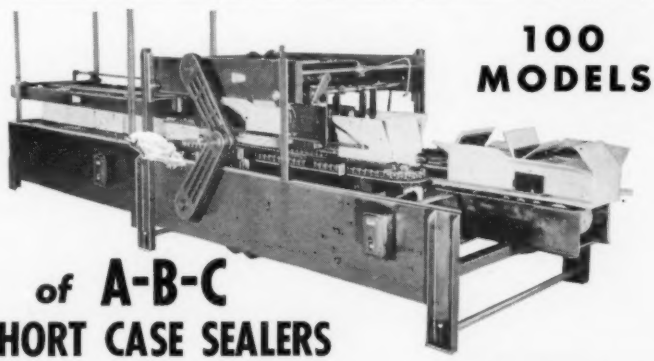
- **Bursting Strength Testers**

Write for complete catalog and price list.

E. J. Cady & Company
Manufacturers 674 N. Harlem Ave.
RIVER FOREST, ILLINOIS

Circle No. 225 on Reader Service Card

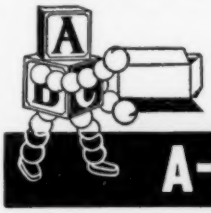


100 MODELS of A-B-C SHORT CASE SEALERS

Save two-thirds of your valuable floor space with the A-B-C Short Case Sealer—with increased packaging efficiency, more speed, less expense . . . Automatically glues, folds and seals either or both top and bottom flaps of shipping cases in one operation. Made in eight models to fit any production requirement. Hot air heaters dry the glue in one-half the time. Speeds up to 30 cases per minute.

TOP QUALITY CASE HANDLING EQUIPMENT

Whatever your packaging job, A-B-C has a production proved machine for you—case sealers, unloaders and unscramblers, side sealers, and hand gluers.



WRITE NOW FOR DETAILS AND FLOOR PLANS

A-B-C PACKAGING MACHINE CORP.
QUINCY, ILLINOIS

For more information circle No. 226 on Reader Service Card

A WORLD OF STRENGTH

in ·UC· round fiber-bodied containers

With all stress evenly distributed over its cylindrical surface, the UNITED container gives you maximum internal and external strength for all packaging needs.

With their multi-ply construction, the UNITED spiral-wound fiber containers give an almost limitless carrying capacity.

UNITED GIVES "EXTRA" STRENGTH

The basic form of the United Can round fiber-bodied container is the secret of its "World of Strength". These fiber cans have greater resistance to shock and are more durable than the usual paper containers (see diagrams)

Today's modern United Can spiral-bodied fiber container is engineered to your individual requirements in any diameter, length, and wall thickness. Many types of barriers, liners and coatings are available to help you solve difficult packaging problems. United Can offers unlimited possibilities to improve the quality of your packaging. A complete survey for industrial or consumer packaging is available to you by contacting your nearest United Can office.

Manufacturers of the "tamper proof" container

·UC· **UNITED CAN DIVISION**
AMERICAN SEAL-KAP CORPORATION

Address inquiries to: P. O. Box 42 J, Phillipsburg, N. J.

Main Plant: Edison Road, New Village, New Jersey
Phone: Phillipsburg, N. J. 5-1135

Branch Plant: Prescott St. and Ridge Row, Scranton, Pa.
Phone: Diamond 2-9118

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(Continued from Page 43)

Crepped Wadding

Kimberly-Clark Corp. has an illustrated booklet showing numerous applications of Kimpak creped wadding as used in packaging a wide range of hard goods. Circle No. 131.

Adhesives

H. B. Fuller Co. has a convenient checklist of adhesives available for packaging applications including set-up boxes, envelopes, glass containers, folding cartons, tube winding, case sealing, et al. Circle No. 132.

Bottle Caps

Anchor Hocking Glass Corp. has an informative brochure explaining how its cap eliminates black-neck and loose liners, how removing and resealing works, and how steam vacuum sealing equipment applies this closure. Circle No. 133.

Collapsible Tubes

A. H. Wirz, Inc. offers a booklet detailing its line of tubes, applicators and closures, including a capacity chart, size and tolerance chart and a standard tube nomenclature. Circle No. 134.

Shipping Containers

Gaylord Container Corp. has a brochure recounting six case histories covering the packaging of automotive parts, bulk plastics and chemicals, lawn mower motors and welding electrodes. Circle No. 135.

Aluminum Foil Containers

Ekco Products Company Catalog D contains illustrations and specifications of its prepared food containers, and includes information on pre-greased, vinyl-coated, perforated, embossed packages. Circle No. 136.

Filling Machinery

Horix Manufacturing Co. Bulletin No. 155 reviews its line of filling equipment for handling still liquids and semi-liquids, including new as well as standard machinery, and including illustrations and explanatory data. Circle No. 137.

Window Bags

Kehr Products Co. has a folder listing its die-cut, full strip and full face types, with details of paper and window material available, including checklist for estimating. Circle No. 138.

Plastic Vials

Lermer Plastics, Inc. offers a leaflet picturing and reviewing its line of plastic vials, including specifications sizes and capacities of its plain, decorated, shell, threaded and shoulder types. Circle No. 139.

Weigher and Filler

The Trescott Co., Inc. has a bulletin featuring illustrations and specifications of its equipment for filling dry material, free or semi-free flowing products, and details of the container range handled. Circle No. 140.

Vacuum Forming Machine

Atlas Vacuum Corp. offers a folder giving specifications (and details of accessory equipment) of its vacuum forming machinery. Details of methods, drape and draw, as well as forming are listed. Circle No. 141.

Colors for Vinyl Plastisols

Claremont Pigment Dispersion Corp. Technical Bulletin No. 140 lists data regarding this company's range of stir-in calibrated color pastes for vinyl plastisol compounding. Circle No. 142.

Re-usable Containers

Peters-Dalton Inc. offers its Technical Bulletin No. 601 which describes features of its re-usable containers and special products, including illustrations and drawings of containers and their applications. Circle No. 143.

More News of Packaging Personalities

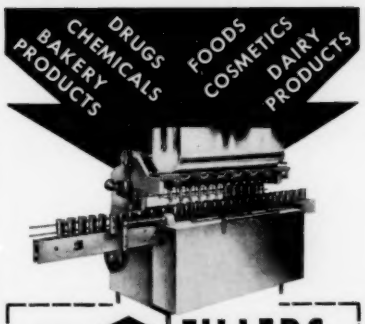
Robert W. Agler is now president of Superior Paper Products Company, Pittsburgh, subsidiary of St. Regis Paper Company. He succeeds **Merlin C. Hamilton,** who now serves the company on a consulting basis. Mr. Agler was previously president of General Container Corporation, Cleveland, also a St. Regis subsidiary.

E. C. Goebel is now vice president and general manager of Superior Paper Products, having previously been its secretary-treasurer and assistant general manager.

Maxwell J. Jones is now president and treasurer of Obear-Nester Glass Company, East St. Louis, Ill. Previously executive vice president, he succeeds the late **Joseph M. Nester** as president.

New vice presidents of Obear-Nester are **Nathan G. Fletcher** (plant operations) and **Mark A. Maley** (sales).

(Continued on Page 50)



USE GEYER **FILLERS**

TO FILL YOUR PRODUCTS

and benefit 4 ways!

Geyer filling machines are your best buy because:

1. one machine handles a variety of sizes and types of containers
2. many semi-liquid and semi-solid products can be handled on the same machine — jellies, jams, preserves, mayonnaise, peanut butter, pastes, etc.
3. they change over easily, quickly to different size and type containers
4. they fill from 20 to 300 containers per minute

Write, wire or call for additional details and let us bid on your job.

THE FILLER MACHINE CO., INC.

the original builder of Philadelphia piston fillers

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Circle No. 228 on Card

Styl-O-Vac

FULLY AUTOMATIC—COMPLETELY ASSEMBLED

CARTON UNLOADER

For High Speed Filling and Packaging Line Operation

Designed for use with Island Styl-O-Matic Rotary, Straightline and Walkie-Pushie Unscramblers, Enliners and Single Filers.

Unloads all shapes and sizes of glass containers 5 to 12 cartons per minute automatically. Easily adjustable to handle any size and shape of standard carton with any number of any size or shape glass containers therein. It's sensational.

GENTLY LIFTS CONTAINERS OUT OF CARTONS RIGHT SIDE UP

REJECTS ALL BROKEN CONTAINERS

CHANGEOVER FROM ONE SIZE TO ANOTHER IN LESS THAN FIVE MINUTES

ISLAND EQUIPMENT CORP.

27-01 Bridge Plaza North, Long Island City 1, N.Y.

Not long ago carload shipments of cases of Amazo Instant Dessert were arriving in badly scrambled condition. Now, these cases leave the company's Roby, Indiana, plant in unitized loads, arrive intact. In this story the engineer who spearheaded the project tells (1) how they solved the basic problem, (2) how they justified the added cost of unitizing, and (3) how they got additional savings — through refinement of the main idea.

How we make our cases arrive intact— and save money while doing it

By James J. McCabe
Industrial Engineer
American Maize-Products Company, Roby, Indiana

James J. McCabe has engaged in industrial engineering work for the past 18 years. He has had wide experience in methods, time study and materials handling — as well as packaging.

By developing unitized loads (together with carloading patterns, including filling of voids) we now ship cases of Amazo Instant Dessert all over the country without getting scrambled and disarranged loads. Further, we are getting reductions in warehouse charges (for case handling) that more than offset the cost of our pallets.

Focal point of our problem: What was happening was that carload shipments of this product were arriving in a jumbled condition — with cases thoroughly scrambled within each freight car. Surprisingly enough, this occurred even with shipments to Hammond, Indiana — which is very close to our plant at Roby. To ascertain accurately what was happening we arranged to have photographs made of car interiors upon arrival at points all over the country.

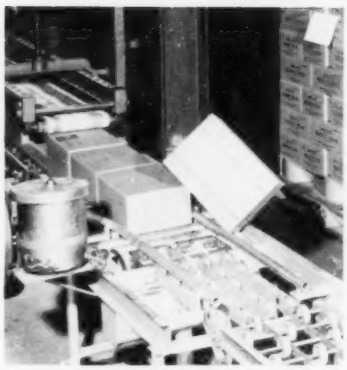
Palletizing Of Cases

Amazo Instant Dessert, in its various flavors, goes into packages holding four and a half ounces each, which in turn go into corrugated cases holding 24 individual packages each. Leaving the packaging room floor these cases move by spiral chute conveyor to the floor below, then go through a Standard-Knapp top and bottom case sealer. Next, these cases pass a Crowe Engineering automatic glue applicator which puts two strips of palletizing glue on the bottom of each case.

We tried eight different adhesives before selecting the one adhesive found to be the best for our particular purpose. We chose it for its adhesion and shear qualities alike. With two strips of this glue on each case a stock handler takes each, places it on a Signode Addison-Semmes expendable type pallet, size 36 by 46 inches. Each pallet holds 192 cases, with twelve tiers of 16 cases each.

REVERSE EACH TIER. We found it advantageous to reverse the loading pattern of each tier, using the same pattern throughout except for this reversing action. There is a void of two and a half inches in each tier but this does not impair the intact riding of each load. However, we did find that the glue alone was not enough to hold a unit load intact

This Is How cases of Amazo Instant Dessert were arriving at destinations prior to development of the new unitizing system. Loads arrived in this condition even on very short hauls. As a first step in reaching a solution American Maize engineers arranged to have photos and reports made of car conditions — upon arrival at points all over the country.



Start Of Unitizing of cases is this Crowe Engineering automatic glue applicator. It puts two strips of glue on the bottom of each case—as shown on this turned-up specimen. Cases stacked on expendable pallets reveal types of loading patterns used. Each pallet holds 192 cases, with twelve tiers of 16 cases each. Pallet size is 36 by 42 inches.

Use Of Tape Strips (filament type pressure sensitive tape) across tops of unit loads helps palletizing adhesive to hold each load intact. American Maize found it unnecessary to run tape strips all the way down side of load; running down about three and a half cases proved sufficient. Torn scrap piece at right makes effective packing between loads.

during transit. To secure each load we experimented with both steel strapping and pressure sensitive tape, eventually deciding on tape.

During initial test shipments we used three-quarter inch tape but we found that one-half inch tape would do the job and we are still using it. This is a Minnesota Mining filament type pressure sensitive tape. We use a 3 M applicator with this tape, putting a strip horizontally all the way around the top tier of cases on each pallet. We also apply at least two strips across the top and down the sides of the load. However, we use only enough tape to go down about three and a half cases.

TAPE PAYS OFF. As soon as we started making shipments around the country with our unit loads taped in this way, the effect showed up at once. Reports from recipients as well as photographs taken for our study disclosed that loads arrived more or less intact. In connection with our taping we found it unnecessary to run the tape all the way down the sides of loads. As noted above, going only part of the way proved enough.

Next phase of our project was the filling of voids between palletized loads within each car. To get a low cost way of doing this we came to use discarded paperboard pallets. We collected these from all over our plant, to which they had brought loads from various chemical and manufacturing suppliers. These pallets did the job, giving us a solid load within each car. Our loaders simply pushed them in as hard as possible, thus making a tight fit between unit loads.

Savings We Attained

Although our project succeeded, with loads arriving intact (instead of looking as though a bomb exploded within the car) we had the problem of actually justifying the cost of the pallet, tape and glue — to unitize each load. However, we not only recovered our costs but came up with some distinct savings. First of these savings appeared in our warehousing operations.

Our plant uses local warehousing space, for which we were paying, typically, two and a half cents per case for in-and-out handling of unpalletized cases of Amazo Instant Dessert. After we started palletizing this item on the 36 by 46 inch pallet our warehouse charge dropped from two and a half to three-quarters of a cent a case, thus giving a net saving of one and three-quarters cents on each case.

PALLETS PAY OFF. These pallets cost us initially $1.30 each. Since we put 192 cases on each pallet with a one and three-quarter cent's saving on each case, we are thus saving $3.36 on each pallet load — on this point alone. However, there are additional savings, such as those resulting from our improved in-plant loading operation.

With our earlier method, cases went onto conventional warehouse pallets, using the same operator who now loads them onto expendable pallets. It formerly took five to six men to load cases into a railroad car, holding five to six thousand cases. This usually took 40 to 48 man-hours. Now, with these unit loads, not more than seven man-hours are necessary to complete a similar loading.

LOADING PATTERNS. Because of variations in freight cars we had to work out different loading patterns. Another variable was that of differences in orders being filled. We now have some 15 different patterns; the foreman in charge of loading selects the appropriate pattern. Incidentally, we found the double door car is generally the easiest to load.

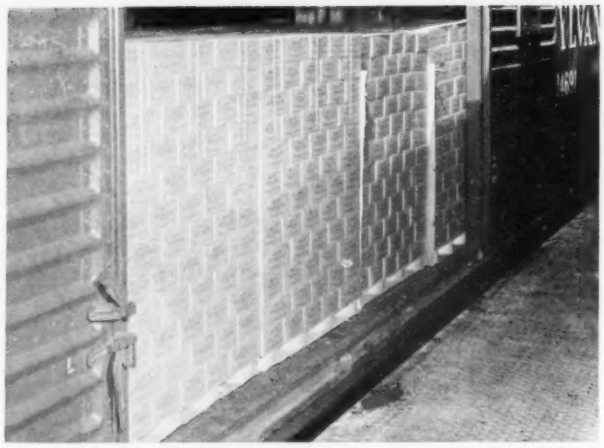
We are now finding that the new types of motor freight trailers lend themselves to shipments of unitized loads of our Amazo Instant Dessert. This is proving true even for shipments to the Pacific Coast. Some of these trailers hold as many as 20 unitized loads of 192 cases each.

Project Not Easy

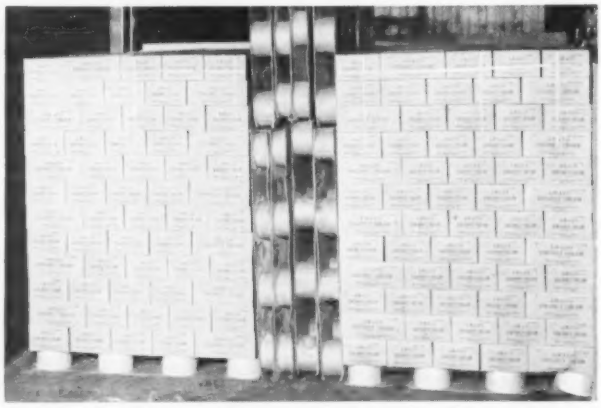
Although it may appear easy to solve as described on these pages, the entire problem was complicated and took a long time to work out. We learned how to try one thing at a time, thus taking pallets, adhesives, strapping and tape, and loading details in sequence. At first, we thought the problem was simple and very mechanical. The deeper we got into it, the more complicated we found it. We spent large sums just in securing photographs of loads at various destinations. These sums were well spent.

COOPERATION NECESSARY. A big factor in the success of our effort was the cooperation of everyone concerned. All-important was the interest and cooperation of the Roby plant personnel, including those actually handling these cases and loads. Not only the management group at Roby gave us full support but also the top management of our company — in New York.

Fortunately, our management had faith in our plant's engineering ability and ingenuity to solve the problem. We might have experienced early failure instead of eventual success had it not been for this support. So many things resulted only through experimentation. For example, in just one detail — our pallet: We found we could reduce its cost by reducing the strength of decking and by reducing height of pallet posts from four to three inches.



Loads Ride Tightly when unitized — as shown in this double door car. Now, it takes not over seven man-hours to load a car. Previously, it took 40 to 48 man-hours — with five to six men loading five to six thousand cases in a car. A double door car is generally the easiest type to load, according to American Maize engineers.



Filling Of Voids between unit loads is an important feature of the American Maize system: Discarded paperboard pallets received at the plant make low cost materials with which to fill these voids. Loaders simply push them in as hard as possible — to make a tight fit between unit loads. Small (two and a half inches) voids between cases within each tier do not affect riding of loads.

Loads Now Arrive looking like this — with palletizing glue, pressure sensitive tape and void-filling pallets all combining to hold each load intact during movement. Aside from making loads arrive in good condition, use of this method gives American Maize savings in warehousing costs: In-and-out handling used to cost two and a half cents a case, now costs three-quarters of a cent.

BEFORE: No matter how pallets of Amazo Instant Dessert were loaded in a car, they suffered damage from slipping, sliding, and shifting due to the normal shocks of car handling.

AFTER: 192 cases on expendable pallets; two strips of palletizing glue on bottom of each case; top layer unitized with strips ½" "SCOTCH" Filament Tape. Now shipments arrive safely as above!

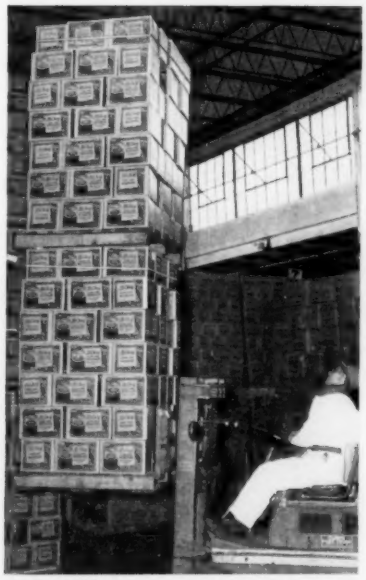
World's strongest tape helps Amazo ship safely...cut warehousing costs 30%!

PALLETIZING WITH TAPE PAYS! American Maize's warehousing charges dropped from 2½ cents a carton to ¾ cent—*a saving, including cost of pallet, of 30% on each load.*

All-grip . . . no slip! Amazing "SCOTCH" Brand Filament Tape has up to 500 lbs. tensile strength per inch of width; mirror surface adhesive puts all the strength to work. Tape does not cut into cartons; won't cut workmen's hands . . . is easily disposed of.

FREE FOLDER: Gives specifications and performance characteristics of "SCOTCH" Brand Filament Tape for all heavy-duty packaging and materials handling needs. Just write on your letterhead.

PRODUCT OF 3M RESEARCH



PALLETIZING cases, drums, etc., makes for easier handling; can often cut warehousing costs. Wrap of "SCOTCH" Filament Tape around top layer secures entire load.

"SCOTCH" Filament Tape 2" wide used to unitize 500 lb. drums for shipment. Tape sticks at a touch; securely holds heavy drums against shifting and tipping.

BAGGED goods can be unitized in transit by simple application of "SCOTCH" Brand Filament Tape as shown. Tape won't cut into bags; is easily disposed of at destination.

For heavy-duty packaging and materials-handling needs...

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SCOTCH BRAND Filament Tape

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn.
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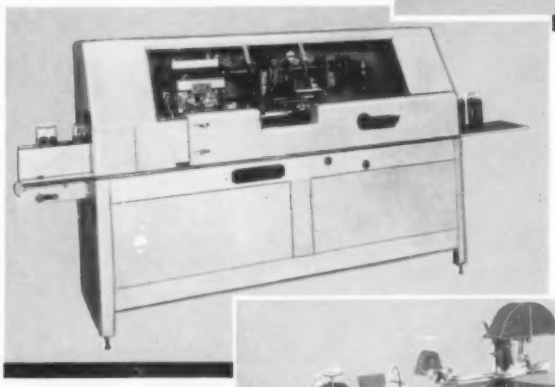
PACKAGING EFFICIENCY STARTS HERE

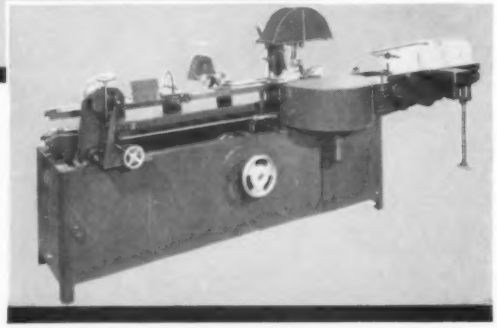
Peters Model SG Carton & Tray Forming & Gluing Machine

Peters newly improved Model UD Cellophane Sheeting & Stacking Machine



New Peters Model L-2 Cellophane Bag Sealing & Header Applying Machine

Peters Model CCY-L versatile, automatic Carton Folding & Closing Machine with liner attachment



Save time, labor and money

Get fast, efficient packaging by replacing slow, worn-out or outdated machinery with Peters high speed, fully-automatic packaging machines.

Peters machines prove their worth by producing attractive, sturdy packages at low cost.

Peters engineers will help you determine your specific requirements.

Write, wire or call . . .

Peters MACHINERY COMPANY

4702 Ravenswood Avenue

Chicago 40, Illinois

(Continued from Page 45)

Frederick S. Leinbach and **G. Lamont Bidwell Jr.** are now vice presidents, of Riegel. Mr. Leinbach continues as assistant general sales manager and Mr. Bidwell as Milford mill manager. **J. Bicknell Lockhart Jr.,** elected secretary of the corporation, continues as manager of merchant and industrial sales.

John W. Hoskins is now Eastern sales representative for F. B. Redington Company, Bellwood, Ill., manufacturer of packaging machinery. He is located in Verona, N. J. **Hamilton Allport Jr.,** formerly in charge of Redington's Eastern office, has assumed new responsibilities at the company headquarters.

William R. Kiner is now manager of drug and cosmetic sales in New York for Armstrong Cork Company's Glass and Closure Division. He has served in the New York area for Armstrong since 1946.

John Seele Jr. is now manager of wine, liquor and carbonated beverage sales for the Glass and Closure Division in New York. He previously was in Armstrong's Chicago office.

Philip H. Sagarin is now president and director of VCA Incorporated, Bridgeport, Conn., aerosol valve manufacturer. He was previously vice president of Bruner-Ritter, Inc., Bridgeport.

Carl J. Snyder is now handling major construction contracts and engineering service contracts of Owens-Illinois Glass Company, at its Toledo headquarters. Previously he was plant engineer of O-I's Fairmont, W. Va., plant.

Edward E. Fay is now Northern district sales manager of The Flint-Kote Container Division of The Flintkote Company. He was previously assistant sales manager of the Southern California district of the company.

Maxwell J. Jones is now president and treasurer of Lincoln Container Corporation, Lincoln, Ill. He is also president of Obear-Nester Glass Company, East St. Louis.

Ben F. Slater is now vice president of Lincoln Container. Previously he was secretary. **Leonard E. Sheppard** is now secretary of Lin-

coln Container. He is also secretary of Obear-Nester.

Thomas W. Allison is now manager, Eastern sales, Aluminum Foils, Inc., and is located in New York. **William F. Kaufmann** is now manager of this company's Midwest sales, in Chicago. **Philip Crane** now has charge of operations in the Cleveland area and is located there. Aluminum Foils has transferred all functions except direct sales and service to its Jackson, Tenn., headquarters.

Harold W. Boyd Jr. now represents Consolidated Paper Company, Monroe, Mich:, at its newly established Pittsburgh office. He was formerly associated with Mead Board Sales.

Ralph W. Penn now heads his own organization Packmaster Sales Company, Akron, exclusive sales agent for Packmaster automatic packaging machines. Mr. Penn was previously president of Pen-Mac-Nye Company, Akron.

J. Warren Kinsman has retired as vice president, director and executive committee member of the Du Pont Company, Wilmington, Associated with Du Pont 40 years, Mr. Kinsman is retiring for reasons of health.

David M. Cunningham is now personnel manager of Stone Container Corporation's Chicago corrugated box factory. He was previously personnel manager of W. C. Ritchie & Co., Chicago, a Stone subsidiary.

John L. Riegel is now president of Riegel Paper Corporation, New York. He succeeds Walker Hamilton, who has retired. Mr. Riegel continues as board chairman and chief executive officer.

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What we think

If anyone ever doubts that continuous self-education and constant self-improvement (both individual and corporate) are the price of success in today's challenging era of kaleidescopic technological progress, all he has to do is take a look at our world of packaging. In fact, an occasional scanning of the field as a whole proves helpful to most of us.

Three things seem to stand out at once when you pause for such a view of the engineering, research, development and production areas of packaging:

1. The amazing *rapidity* of our technological changes —they are coming almost too fast for comfort.

2. An unprecedented demand for know-how, for information, for education in all its forms—to meet the needs of you who deal with these fast-moving packaging changes.

3. A general stepping-up of facilities and channels by which all this know-how passes from you who have it to you who seek it—and vice versa.

It is immaterial whether the changes generate the demand for more know-how or whether the constant development and refinement of know-how generates the changes. It is a mutually interdependent relationship, like a sort of accelerator to the expansion of packaging's educational media. The basic pattern seems clear: (1) New things constantly appearing, (2) more information needed by more people, and (3) stepped-up efforts to fill the voids, to get the word across.

Those of you taking full advantage of the educational resources of the packaging field already know that a wealth of know-how is there for the taking. A brief look at what is going on may sell others on the need of taking such full advantage.

Now, let's look at two types of educational effort, (1) the schools and (2) the associations. Of the schools, there are across the country more and more colleges and universities giving material on packaging. Three examples illustrate the point.

Columbia University's package engineering courses are now in their fifth year. Currently, more than 20 specialists share their know-how with the students taking these courses. The list of instructors and lecturers is a galaxy of top-caliber, technical men from leading supplier and user companies. Fortunate indeed are those who can attend their classes.

Wayne University's courses in packaging offer the mature student (already holding a responsible packaging position) a laboratory approach to the solution of actual, specific problems in packaging. These courses are geared closely to the industry needs of the students.

Michigan State University offers a unique, four-year course in packaging technology. This pioneering program is growing rapidly; its students seem to increase by geometric progression. It promises to supply our field more and more enthusiastic, competent beginners—capable of going far in packaging.

Turning to the educational efforts of the associations, we might cite three leading groups that are actively stepping up their services. American Management Association not only is broadening the scope of its conferences, but is going afield with a variety of technical and managerial packaging programs. Packaging Institute (its last forum had a record-breaking attendance) is stepping up its use of concurrent sessions, is broadening its committee and regional meeting functions. The Society of Industrial Packaging and Materials Handling Engineers is boosting its output of basic and advanced materials, is striving to accelerate the professionalization of the field, is exploring new areas of service. Other associations concerned with packaging in various ways are making similar efforts to meet the packaging needs of their members.

We of Package Engineering deem it a privilege to be able to serve you, our readers, at this particular time, to be able to give you a wide range of contributed and staff written material (specifically geared to your needs) during an age when the need for continuing technical education was never greater.

With enthusiasm we urge you to participate in the work of your associations and to take the many packaging courses offered by the schools. With humility we offer you Package Engineering. We hope its articles, presenting the experience of important companies and the opinions of recognized specialists, help you do your jobs better and help prepare you for today's constant flow of technological progress.

Bruce Hollingren

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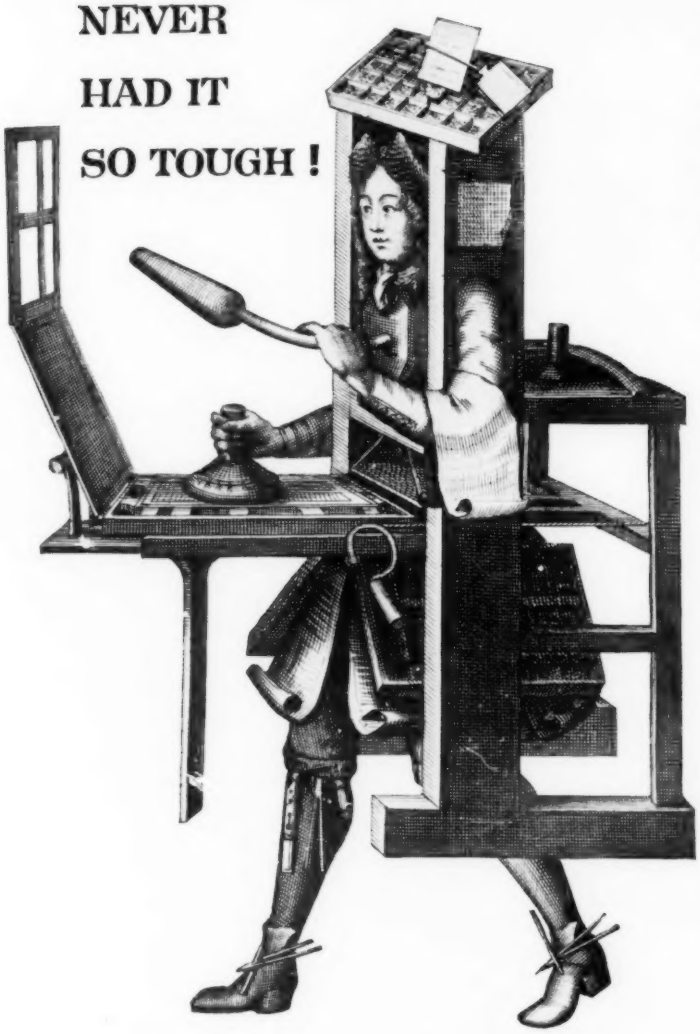

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The A. H. Wirz company is happy to strengthen its contacts with you as readers of PACKAGE ENGINEERING. We hope that you will always feel free to contact us for help on your particular packaging requirements. We may have information that will be of help.

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